

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

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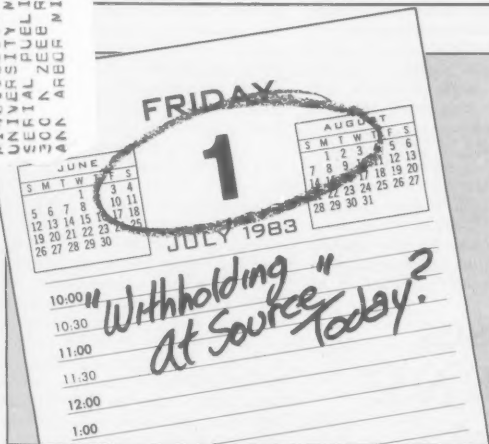
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NEWSPAPER



## DP Execs Ready, But Withholding Act Still Up in the Air

By Paul Gillin  
CW Staff

With the status of the Tax Equity and Fiscal Responsibility Act of 1982 changing faster than the odds in a game of five-card stud, DP managers are hedging their bets in favor of the bill's enactment.

"We're absolutely, totally ready," said George DiNardo, senior vice-president of information management and research at Mellon Bank of Pittsburgh, Pa., reflecting the status of most DP executives recently interviewed by *Computerworld*.

In fact, the executives have generally softened their opposition to the concept, which in part requires financial institutions and corporations to withhold 10% of interest and dividend payments and pay those funds directly to the Internal Revenue Service.

"Four years ago, I was down there [in Washington, D.C.] testifying and doing my best to defeat [the measure]," DiNardo commented. "We're now of the position that the government did a fair job" of accommodating bankers' comments. "If the IRS is having the worst of difficulties capturing these funds, maybe it's time everybody gets on board in backing this kind of program."

Nevertheless, the cost of preparing for Tefra has been high, largely because of the many adjustments made by the government since the bill was passed. In the hubbub of repeal measures and political jockeying that has surrounded the measure, the government has failed to consider many of the circumstances that could force fine-tuning after Tefra is enacted, according to managers.

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●The Senate is slated this week to take up a measure already passed by the House that would repeal the "withholding at the source" provision. Story, Page 9 ●Some users are finding the reprogramming required to comply with the measure less painful than expected; others are finding it considerably more difficult. Page 8 ●A number of software vendors have already delivered modifications to their banking packages to comply with the regulation. Page 8

## Sperry Adds 1100/70 Series As 1100/60 Upgrade Path

By Ed Scannell

CW Staff

BLUE BELL, Pa. — Sperry Corp. today carved out an upgrade path for its 1100/60 users by unveiling a mid-range series of single- and dual-processor mainframes. The 1100/70 series offers four times the internal memory capacity of the 1100/60 systems, but costs 30% to 40% less, Sperry claimed.

In addition to the 1100/70 introductions, Sperry announced:

- The formation of Sperry Credit Corp., which will refer potential Sperry users to banks, other financial institutions and third-party lessors from which, according to the firm, they can obtain leases up to five years in term at less cost than if they leased the equipment directly from Sperry. The company estimated that customers will be able to save 10% to 15% by going through the credit corporation.

- The Sperry 5055/Uniservo 26 and 28

magnetic tape subsystems, which reportedly offer group coded recording capability to transfer information at 480K byte/sec and 750K byte/sec, respectively. The two subsystems can be used with all 1100 series mainframes.

Expected to compete against IBM's 4341 line, the 1100/70 family of mainframes introduced by Sperry today consists of seven single-processor and eight multiprocessor machines that have performance ratings ranging from .4 to 2.4 millions of instructions per second. According to Sperry's director of major systems, Thomas Flynn, the 1100/70s are targeted at Fortune 1,000 companies in which "they will coexist with IBM mainframes such as the 8100 and 3083."

The new systems, available immediately, can store four times as much data as comparably configured 1100/60s through the integration of 64K-bit memory chips, the firm said.

(Continued on Page 6)

## Stolen From Wells Fargo?

## Bank's Source Code Tapes Vanish

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — Six reels of magnetic tape containing the source code for all of Wells Fargo Bank's major financial applications have mysteriously vanished in what appears to have been a theft.

The media, which were copied from records in the bank's main tape library before being transferred to an employee's office, were last seen on May 3. One day later, Wells Fargo security personnel discovered that the tapes were missing and notified their superiors.

Reports of the disappearance triggered a widespread security search of employee work areas, including desk drawers and overhead cabinets. But the search proved fruitless, and as of June 1, the whereabouts of the tapes remained unknown.

Rumors of the apparent tape theft began leaking from sources close to the bank about two weeks ago. Confirmation of the reports finally came from an official Wells Fargo spokeswoman on May 31.

Wells Fargo has apparently refrained thus far from reporting the loss of its tapes to

local law enforcement agencies. "We're still trying to determine in our own minds whether a theft has actually taken place," the spokeswoman said.

Although the missing tapes contain little if any system software, they store the source code for all of Wells Fargo's Cobol application programs, three bank insiders independently confirmed.

Included on the tapes are at least several application packages that were supplied to Wells Fargo by independent software companies, the

(Continued on Page 4)

## User to Tie PBX, Local-Area Nets

By Bruce Hoard

CW Staff

ANAHEIM, Calif. — A plan at the Upjohn Co. is proof that private branch exchanges and local-area networks are coming together.

In a session at the 36th annual International Communications Association's Conference and Exhibition here last week, Upjohn's Corporate Communications Manager Glenn Miller described how his company is planning to operate at the confluence of those two technologies.

Corporate headquarters for Upjohn, the fifth largest

## CW at ICA

Coverage of the International Communications Association's annual conference continues on Pages 10-13.

pharmaceutical manufacturer in the world, includes 186 buildings spread across a 25-mile radius in and around Kalamazoo, Mich. A year ago, the firm had 13 local-area networks, most of them operating independently of the others.

"We were appalled by the

duplication," Miller recalled.

Things were looking even more convoluted for the future. According to Miller's projections, if the company did not stop the uncoordinated network growth, there would be 45 independent networks by 1987.

Money was also a consideration. Miller claimed that if Upjohn sat back and did nothing, it would spend \$99 million on communications over the next few years. He said 25% of that sum would be directly related to AT&T's divestiture.

The projected integrated

(Continued on Page 4)



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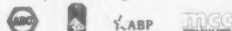
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## For IBM Processors

# Xerox Unveils Info Center Support

By Robert Batt  
 CW West Coast Bureau

LOS ANGELES — Introducing what it termed its "second-generation information center," Xerox Computer Services here, a division of Xerox Corp., has announced five IBM-compatible software packages. The packages run on IBM 370, 30 series and 4300 processors in SSX, VSE, VS/1, MVS and VM operating environments with either Btam or Vtam.

The five packages include:

● **Reporter II**, a report/query program generator that reportedly uses interactive dialogue to enable users to specify the content, format and layout of reports. It can either form part of a major system or be used to generate report programs and queries, which operate in a private subsystem to accommodate custom applications.

● **Filer II**, a structured programming language using interactive dialogue to enable users to enter statements about data processing work to be performed. The product can be used by systems analysts and programmers to write standard programs with statements and compiled programs stored in a program library file, Xerox said.

● **Definer II**, designed to allow users to define data base contents, format of records and data elements within records. Definer II reportedly specifies data bases for new applications and modifies and maintains the definitions of existing applications.

● **Control**, a prompt-driven decision support system for nontechnical business professionals making financial management plans. The package is said to allow users to perform budgeting, financial consolidations and the modeling, manipulating and analysis of numeric information. It is documented on-line with Help statements for each prompt.

● **Control Strategist**, designed to handle spreadsheet analysis, financial modeling, time series forecasting and basic statistical analysis. It uses a two-dimensional matrix of rows and columns that can be grouped together in files and linked via an interface with a relational data base management system and graphics package.

The five products are part of what Xerox calls its Unified Systems Architecture, which reportedly ties together information center software and data base products. This, the vendor claimed, negates the need to build data bridges between existing corporate data bases and an information center data base and, therefore, constitutes a second-generation information center.

The software packages permit the use of Xerox 820-II or other CP/M-compatible personal computers as intelligent terminals addressing a mainframe computer. The data can be extracted from business files in the host computer and downloaded to the personal computer.

The packages are available independently or together. Reporter II, Filer II and Definer II are sold as one package, costing \$40,000, while Control and Control Strategist are available as a package for \$65,000.

Available immediately, the software products are also offered through the Xerox time-sharing network, Xerox Computer Services noted from 7899 La Tijera Blvd., Los Angeles, Calif. 90045.

## White House Proposes Grouping NBS With NSF

WASHINGTON, D.C. — The National Bureau of Standards (NBS), now part of the Commerce Department, will become attached to the National Science Foundation (NSF) under plans for a new Department of Trade announced by the White House last week.

In releasing details of its trade reorganization plan, the White House also proposed keeping the National Telecommunications and Information Administration grouped with the major Commerce units. Those units would be merged with the White House's U.S. Trade Representative's Office in one organization, the idea being to merge the policymaking functions of the trade representative with policy implementation activities now carried out by the Commerce Department [CW, May 9]. Meanwhile, trade department

bills originating in Congress, which are slightly different from the administration proposal, continue to advance. Evidently in response to the substance of those alternative blueprints, the White House has streamlined its reorganization plan and recommended shifting a number of current Commerce agencies to other Cabinet departments.

Proponents of a so-called "lean-and-mean" trade department argue it must be relatively small to be responsive to the changing needs of domestic and international business. Additionally, responding to complaints that the Trade Representative's policymaking expertise might be lost if it is shuffled into the new trade agency, the White House now proposes to keep that office's functions intact as a policymaking center for the new, larger Department of Trade.

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# THE INFORMATION CENTER

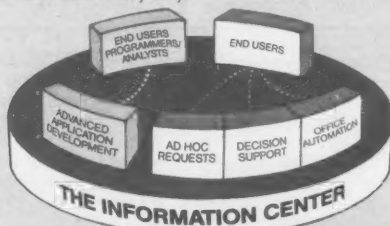
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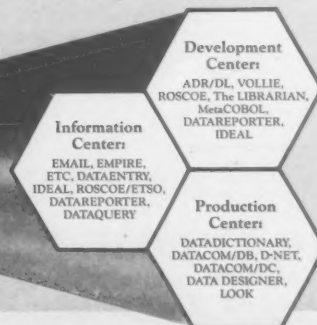
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# Tapes With Wells Fargo Source Code Vanish

(Continued from Page 1)

spokeswoman said. All the vendor-developed programs are believed to be proprietary.

Whether the confidentiality of the companies' proprietary programs has been compromised and whether Wells Fargo will face any legal liability as a result of the recent tape disappearance has yet to be determined. A Wells Fargo spokeswoman, however, discounted the possibility of legal action against the bank, primarily "because the disclosure — if there was any — came without our authorization."

In addition to the vendor-supplied software, the six missing tapes reportedly contain the source code for all the applications developed by Wells Fargo's own internal programming staff. Some of those applications are said to include demand deposit accounting, savings, general ledger and automated teller machine services.

## Impact on Wells Fargo?

Opinions vary widely on the question of how, if at all, the loss of Wells Fargo's source code tapes is likely to affect the bank's business operations and financial health.

One source sees the apparent tape theft as potentially harmful, especially if the magnetic media land in the hands of a rival bank. "If I worked for another bank, I would love to get my hands on those tapes," said Scott Humphries, a former Wells Fargo employee who recently joined a hospital information system vendor as a senior DP trainer. "I could then use the tapes to figure out what Wells Fargo does with its money and eventually offer my own customers the same services."

Humphries' thoughts were echoed by a second individual who still works for Wells Fargo. "The main risk [that the tape disappearance poses for Wells Fargo] is that a competitor could observe how the bank

SAN FRANCISCO — Wells Fargo Bank's recent loss of six valuable source code tapes apparently resulted, in part, from a breach of the institution's own internal security procedures.

The tapes inexplicably disappeared in early May after sitting in plain view on or near an employee's desk for several days. Such prolonged exposure in an open, unsecured area would appear to violate a standing Wells Fargo security rule requiring all unused tapes to be kept either in the bank's source code library or in a locked enclosure.

Another security violation apparently occurred at about the same time the tapes were removed from their usual holding area without the appropriate management authorization.

Wells Fargo requires its employees to sign a checkout form before they transfer source code from the bank's tape library to an unsecured work area.

That simple precaution, however, was apparently circumvented in the case involving the six tapes that were recently discovered to be missing.

Reports of the purported security

violations were first circulated by unofficial but well-informed sources inside or close to Wells Fargo. The rumors were then officially confirmed last week by one of the bank's press liaison officers.

Both violations of Wells Fargo's security guidelines appear to have been traced to one of three product managers in the bank's quality assurance department. That manager reportedly asked that the bank's application source code be copied onto magnetic tape and then be removed from the organization's main program library.

Although the manager was authorized to use the six source code tapes, she obtained them without signing the required checkout documents, a Wells Fargo spokeswoman confirmed last week. The spokeswoman also confirmed reports that the tapes were sitting unsecured in the product manager's office for several days before they disappeared.

"She [the product manager] really shouldn't have kept them out in the open for such a long time," the spokeswoman said. The product manager could not be reached last week to comment on the purported security violations.

Wells Fargo security officers, who reportedly had been keeping a close eye on the source code tapes for several days before they vanished, were said to have last seen the missing property in the product manager's office.

As of June 1, however, bank investigators had reportedly failed to uncover any evidence directly linking the product manager to the tapes' disappearance.

Shortly after in-house security officers reported the source code copies missing, a number of Wells Fargo employees were asked to take lie detector tests in an unsuccessful effort to recover the tapes.

In the aftermath of the disappearance, Wells Fargo is said to have tightened its physical security, especially at the building's main entrance and exit points. But a source who works in the bank's systems department described the toughened safeguards as "still pretty lax."

"I was talking to some people in the main lobby a few days after the tapes were taken," the source recalled, "when I saw a guy walk out the front door with a reel of tape under his arm. No one ever challenged him."

writes its code and estimate roughly how much time we would need to develop and introduce a new customer service," the individual said. "So a potential rival might be able to rush a new product to the market before Wells Fargo."

But another of the bank's current employees downplayed the possible impact of the tape loss on Wells Fargo's ability to make money. When the contents of the bank's application source code pool were copied to

six spare tapes and moved to another location, an employee intentionally or unintentionally omitted the programs' copy library numbers, that employee said.

Copy library numbers reportedly provide a means of readily retrieving record layouts, screen formats and frequently used routines that pro-

grammers need to run certain Cobol programs. Without the copy library numbers and their corresponding routines, an unauthorized user of Wells Fargo's source code tapes would find itself unable to easily reconstruct or recompile the bank's applications, two current employees said.

## User to Tie PBX, Local Nets

(Continued from Page 1)

corporate network plan he described will cost only \$12 million, not including labor costs.

Although the plan intends to sort out the local-area network tangle, it is slated to do so without forcing the company to dismember completely the IBM 3270 coaxial cable networks currently in place. "It is very viable for us to tell people to hang on to their equipment," Miller said.

That equipment includes 7,200 telephones, 1,500 data terminals (a number that will soon double) and 50 facsimile terminals. There are approximately 100 Xerox Corp. Model 860s, 850s, 820s and 8010 Stars. Miller expects to have three times as many Xerox devices soon.

The plan calls for a PBX or PBXs from Intecom, Inc., Northern Telecom, Inc., Rolm Corp. or Michigan Bell to tie together both the 3270s and four Xerox Ethernet local networks. The most likely number of PBXs is five because of the added safety of redundancy, he said. "I suspect we will end up with a multi-node network instead of putting all our eggs in one basket," he observed.

Miller said Michigan Bell is following in the innovative footsteps of such maverick Bell operating compa-

nies as Southern New England Bell and Cincinnati Bell in offering to provide and maintain non-Bell equipment.

Upjohn, which recently upgraded its data communications operations to equal status with DP, developed a four-layer plan for corporate integration. They are local, community, domestic and international. Miller said 82% of all information flows in and around Kalamazoo, so initially the strongest emphasis will be on the local and community levels.

On the community level, remote locations will be tied together through T1 (1.5M bit/sec) microwave links and, in cases where microwave is unusable because of line-of-sight problems, through fiber-optic cable. Some of the services expected to be transmitted include voice mail and electronic mail.

Three of the four Ethernets are currently linked, and the fourth one will be tied in soon. "The fourth is going to be the real test," Miller said. Part of the problem involves wiring a 13-floor building in downtown Kalamazoo with coaxial cable.

Nonetheless, Miller referred to Ethernet as a de facto standard and said that the entire corporate network will be Ethernet-compatible.

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## Good Growth Path, Good Buy System/36 Looking Good to System/34 Users

By Tom Henkel  
CW Staff

IBM appears to have won back the hearts of its System/34 users with the newly announced System/36. Nine out of 10 System/34 users polled last week said the System/36 appears to offer an easy, effective upgrade path from System/34.

Better yet, the System/36 looks like a good buy to these users.

Several DP executives said they are already setting internal wheels in motion to buy a System/36. Others, who are not quite ready for an upgrade, said they feel much better knowing they have a growth path.

Still others pointed out that the System/36 will make it easier to migrate to IBM's larger System/38. The previous System/34-to-System/38 conversion route had long been a point of contention for System/34 users who, in spite of various IBM conversion aids, maintained that upgrading to a System/38 was too difficult and too costly.

Dennis Roundtree, DP manager at Eller & Co., Inc. in Fort Lauderdale, Fla., said the System/36 will make upgrading his "maxed-out" System/34 a reality. He could not justify the conversion costs involved with upgrading a System/34 to a System/38.

Eller & Co. was seriously considering upgrading to a System/38 last year. But when conversion costs were included, the new machine would have wound up costing more per month to operate than the existing System/34, according to Roundtree. In an uncertain economy, his company was not willing to approve the expense.

Now Eller & Co. will probably order a System/36 by the end of the year. The System/36 "is what we've been looking for, and waiting for, for about three years," Roundtree said.

The System/36 will probably offer the bonus of a smoother conversion to System/38, he added.

Arnold Jacobson, a vice-president at Goddess Bra Co. in Boston, contended that he could have saved about \$50,000 if IBM had announced the System/36 six months earlier. That is how much it will cost to convert between 700 and 1,000 System/34 programs to run on Goddess' recently acquired System/38, Jacobson said.

"I couldn't wait," Jacobson said. His system had been overloaded for about a year before the System/38 was brought in.

While he was disappointed that he will not be taking advantage of the System/36, Jacobson applauded the processor. "It's a great machine for the money."

The city of Lewiston, Maine, is seriously considering buying a System/36. DP Manager Robert Morlock plans to submit a proposal asking the city to upgrade to a System/36 sometime this year.

A planned expansion of the city's services to include a data base for the fire and police departments will probably prove to be the final blow for the city's already overworked System/34. DP services provided for the city's high school already make the System/34 work overtime, ac-

cording to the DP manager.

"System/36 sounds like a hot-rod System/34 to me. It's a good, solid machine," commented Mike Kouns, assistant vice-president for DP at Boone County State Bank in Lebanon, Ind.

The bank has no immediate plans to make an upgrade, but the System/36 announcement opens up two good options for the future, according to Kouns. Besides providing an upgrade path for the System/34, it will undoubtedly drive down the cost of System/34 processors, he said. That means it may be more cost-effective to bring in a second System/34 instead of migrating to the newer

System/36 or the larger System/38.

But Roundtree, who has already tried the multiple-System/34 approach, thinks the System/36 is still the better buy because users must make a lot of file transfers on multiple System/34s.

### Attractive Option

In Iron Mountain, Mich., MI Electric, Inc.'s DPer Ralph Reimer said of the System/36, "From all I've seen, I like it." Until now, he said, the firm has been trying to decide whether to buy a System/38 or add a second System/34 processor.

The company has yet to make a formal decision but, Reimer said, the

reported easy conversion to the System/36 makes the newly announced processor an attractive option.

Only one of the 10 DP executives polled has been unimpressed by the System/36. Robert Lamberson, computer center director with Hobart and William Smith College in Geneva, N.Y., said the school plans to phase out its System/34 in about three years, when it will switch over to a Harris Corp. 500 minicomputer. The school already has converted some administrative applications programs to run on the Harris 500.

The System/36 announcement has not changed the school's plans, Lamberson said.



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## Focuses on 'Saving Lives, Property'

# L.A.'s DP Shop Opts for Dealing With Reality

By Marguerite Zientara  
CW Staff

LOS ANGELES — A lot of things happen here that strain the distinctions between fantasy and reality.

Take the time Wendell Meyer, then the newly appointed general manager of the Data Service Bureau for the city, played host in his data center to a movie crew and actor Tim Conway on roller skates.

Now, five years later, Meyer has forgotten the title of the movie that was filmed in his installation, but remembers vividly the week and a half of disruption it caused.

"That was the last movie we allowed to be filmed here," he bemusedly recalled in a recent interview. Disruption, it became clear, is one thing the Los Angeles DP operation emphatically does not need. With responsibility for police message switching and dispatching, fire and ambulance dispatching and Los Angeles harbor and airport data operations, "the criticality of saving lives and property" makes Meyer's job unique.

"A few seconds makes a difference when you're dealing with a fire or an ambulance," he noted. "This is a real on-line system."

The city has an IBM 3081 and 3033 for general-purpose computing; two IBM 4341s for police message switching; four Digital Equipment Corp. PDP-11/70s for police dispatching;

two PDP-11/23s for fire and ambulance dispatching; and one IBM 4341 each for the Los Angeles International Airport and the harbor. The shop is "totally Systems Network Architecture," he noted.

The 350-employee DP shop serves about 40 departments comprising 26,000 people. By next year, personal computers may invade the territory, but until now, the Data Service Bureau has discouraged their use, Meyer said, because there are no standard interfaces yet. By July 1, there are expected to be 80 IBM Displaywriters installed in user departments.

Within two years, the department expects to integrate data, text, image and voice using IBM's Document Interchange Architecture and Document Content Architecture, Meyer indicated.

Other than the criticality of response time, Meyer's concerns are "just like any large DP shop," he said. His chief problems are keeping up with the changing technology and, more pressing, "getting systems programmers," he said.

With 25 systems programmers currently on the staff, Meyer would like to see a few more. "It's not really the number that's important, but rather getting them with the experience we need," he noted.

"We're dealing with very complex operating systems, protocols and networks that are tied into county, state

and federal systems," he explained.

How is Meyer keeping the people he has now? "By being a modern shop and offering competitive salaries," he said.

But that's not all. "We're growing our own technical talent by encouraging our people to teach courses at the local universities," Meyer explained.

While the universities usually provide basic courses, eight or nine of Meyer's programmers teach data bases and other advanced subjects "that they and we need," he said.

The Data Service Bureau also has an internship program at the California State University at Los Angeles, another source of future talent, he said.

## Sperry Unwraps 1100/70

(Continued from Page 1)

The 1100/60 systems use 16K-bit chips.

All 15 models utilize the vendor's 1100 operating system and are compatible with applications software written for the 1100 series. Users of the 1100/60 systems can field-upgrade their systems to 1100/70 capability for \$60,000 to \$90,000, depending on how much memory their present systems hold.

A key feature of the 1100/70 systems are central processor and I/O units that function independently but are housed in a single cabinet that saves floor space, a spokesman noted.

Another hardware highlight of the system, according to Sperry, is its main storage, which is integrated into the CPU cabinet. Each processor stores up to 16M bytes of memory, with the multiprocessor models storing up to 32M bytes.

This improved memory capacity enables the 1100/70s to make better use of the company's Decision Support and Development System software package, the spokesman said. An extended instruction set allows 1100/70 users to extract more performance out of high-level languages and systems software, he added.

The 1100/70's central equipment complex contains either a Distributed Communications Processor (DCP) 40, which supports 256 communications lines, or a DCP 20, which handles as many as 48 lines, as well as a DCP 10 that supports up to six lines. The DCPs serve as front-end processors for all communications interfaces including transaction processing, time-sharing and remote job entry.

The 1100/70s have a disk controller that permits the attachment of up to 16 of the company's 512M-byte Model 8450 and 8470 disk drives to a single or dual channel. In addition, it connects up to four 8480 disk drives, each of which also stores up to 512M bytes, and is compatible with three versions of the company's cache/disk subsystem, all Sperry-supported public data networks and distributed data processing connections.

Filling out the list of systems features and capabilities are multiple I/O units, common access to most sys-

tem components in multiple CPU and I/O unit systems, independent I/O units, byte-oriented I/O channels, word-oriented I/O channels, redundancy among system components and independent simultaneous communications processing.

The price of the 2M-byte, entry-level 1100/71, which offers a systems support processor, DCP 10 communications processor, 5057 mass storage processor, two 8470 disk units, two Uniservo 22 magnetic tape units and a 0776 line printer, is \$395,297. On a five-year leasing plan, the system leases for \$10,504 a month.

### Tape Subsystems

Both Sperry's Uniservo 26 and Uniservo 28 are dual-density group coded recording (GCR)/phase-encoded units. Transfer rates are 480K byte/sec GCR and 120K byte/sec phase-encoded for the Uniservo 26 and 750K byte/sec GCR and 200K byte/sec phase-encoded for the Uniservo 28.

The tape subsystems can be configured with one to eight tape units and one or two control units, Sperry said.

The subsystems provide a dual-channel option that allows a 5055 control unit to attach to two block multiplexer channels. Dual access options are available on the tape unit.

The 5055 control unit costs \$22,700; the Uniservo 26 costs \$22,000; and the Uniservo 28 is priced at \$24,750. Monthly cost on a five-year lease is \$610 for the 5055, \$620 for the Uniservo 26 and \$690 for the Uniservo 28, including maintenance.

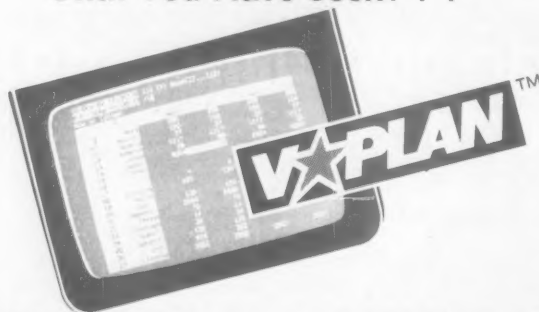
The tape subsystems will be available in November. More information is available from Sperry through P.O. Box 500, Blue Bell, Pa. 19424.

## Corrections

All three members of National Advanced Systems, Inc.'s AS/8000 processor family support IBM's Extended Architecture (XA), contrary to what was reported in a recent story [CW, May 16] about the product line's introduction.

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# Compliance Easy for Some, Hard for Others

By Paul Gillin

CW Staff

Although few bank DP managers are fans of the Tax Equity and Fiscal Responsibility Act of 1982, some found the reprogramming required to comply with the law less painful than expected, according to interviews conducted recently by *Computerworld*.

However, DP executives at banks that administer many trust funds or offer a variety of investment plans have found compliance considerably more difficult.

The Mellon Bank of Pittsburgh, Pa., budgeted \$1 million for the modifications but was pleasantly surprised when costs came in at only \$600,000, according to George DiNardo, senior vice-president of information management and research. "It really wasn't as complex as we thought. They kept relaxing the rules as we went along."

Mellon Bank maintains for every customer a central name and address file that includes account relationships. "That's a very convenient place to store that information so that when each application system posts interest, we dump that into a bucket on the central file," DiNardo said. "Thus, we have a grand collector, and we deduct the 10% from that."

## Separate Field for Interest

Mellon also wrote a separate field into each application to capture the interest and deduct it when it reaches a certain amount. Customers will see a separate line on their statements, indicating the total amount withheld, and the Internal Revenue Service will get a breakdown of withholding by each interest-bearing account.

The Provident Savings Bank of Baltimore found that a packaged application was cost-effective for its

smaller operation, according to Richard Biggs, vice-president of information development and applications. The bank bought a package from Disc, Inc. that calculates the withholding amount as the information is passed from the posting transaction.

As a result, the bank has had to modify less than 7% of its total application library, Biggs said. "If we had chosen to go in-house, we would have had to change all the reporting and totaling programs. All we do now is deal with the posting and crediting programs, and all of the reporting is a byproduct of the Disc package."

Most executives interviewed said that trust accounts, which usually contain many subaccounts, presented the worst problems, particularly in light of the numerous exemptions allowed by the law.

"Say we have an account from an estate and there are 20 people who

are beneficiaries of the proceeds of the earnings of that account," said Jack Grantham, vice-president of the Trust Systems Group at the Bank of America in San Francisco.

"We have to split up [the proceeds] 20 ways and withhold 10% from that and associate it with those 20 people before sending it to the government. Some of them may be exempt and some may not," according to Grantham.

"It's not simply a matter of withholding interest on thrift accounts held by a consumer," according to a DP executive from a major Northeastern bank, who declined to be identified.

He added that his bank's withholding project is coming in over budget, "strictly because we are a reasonably good-size organization, and there are a number of variables. As we got into it, the project became increasingly complex."

# Vendors of Banking Software Ready for Tefra

By Lois Paul

CW Staff

Vendors of banking software packages have already delivered modifications or new modules designed to meet the "withholding at the source" regulation their users face July 1 if it is not repealed.

A number of vendors began making the required changes or building new systems last summer, when the Tax Equity and Fiscal Responsibility Act of 1982 was passed. The act's provision that 10% of interest and dividend payments be withheld is scheduled to take effect July 1 if repeal efforts are not successful.

But even if this portion of the legislation is repealed, the act still contains requirements for information reporting and withholding on Individual Retirement Account (IRA) disbursements. The changes that software vendors have made to their software packages will meet these requirements, they stressed in recent

interviews with *Computerworld*.

Hogan Systems, Inc., a Dallas-based software vendor, delivered modifications to its Hogan Integrated Deposit System at the end of April. The software involves on-line tables by which the user can set up activities or processing criteria.

"We created a new one for withholding," explained Gayle Swanson, the vendor's manager of deposit maintenance. "It does withholding applied to interest or annuities or both. So by a matter of going in on-line and setting this flag, they can turn it off or on for IRAs, for example."

The effort to make the extensive changes to the software began in December, after Hogan put together a 170-page document that interpreted the regulations and determined its course of action. The actual conversion took 175 man-days of effort and required the development of 20 new modules and adjustments to 50 dif-

ferent programs, Swanson said.

Hogan also developed interfaces to several other vendors' withholding packages for customers who wanted to combine them with their Hogan software.

One of those other vendors is Pacesetter Systems, Inc., also of Dallas, which developed a \$38,000 separate withholding package called Pacer/IRS that was delivered to 30 customers last week. Pacesetter conceived Pacer/IRS last July and worked with 16 large banks to refine its design, according to Jim Atchley, the firm's executive vice-president.

Representatives of those 16 banks and 14 other banks that have been licensed to use Pacer/IRS recently went to Dallas to receive training on the new software.

After developing Pacer/IRS, Pacesetter met with Hogan Systems and supplied the firm with the technical information required to develop an interface linking Hogan's banking software with the new package from Pacesetter.

Another firm that worked with Hogan to develop an interface between the two firms' products was Disc, Inc., a Baltimore firm that delivered the withholding portion of its Combined Interest Reporting System in early May.

Disc originally planned to enhance its year-end reporting system, but then decided instead to design a totally new withholding system, according to Albert Harris, Disc president.

The package took four man-years to develop; Disc staffers began working on it in December. "At one point, we had almost every technician in the company doing one part of it because of the time restrictions," Harris said.

The withholding system actually is bundled into Disc's Combined Interest Reporting System. The vendor worked out upgrade pricing for the additional withholding software for current customers of the software. "Some of them paid very little for that portion, as low as \$5,000," Harris said.

Disc offered a number of banking software vendors the opportunity to develop an interface to its withholding software from their existing systems. Hogan accepted this offer and modified its software so that a module embedded in its deposit system provides information to the Disc withholding system.

The Orlando, Fla.-based Florida Software Services, Inc., a subsidiary of Kirchman Co., delivered changes to four of its banking applications packages in mid-May. This firm's modification of its software took about six months.

## Law Firm Starts Tefra Hot Line

WASHINGTON, D.C. — The legislation slated to go into effect July 1 that requires financial institutions to withhold 10% of their customers' interest and dividend payments has raised so many questions that a group of lawyers here set up a hot line to deal with them.

The Tax Equity and Fiscal Responsibility Act (Tefra) Hotline Call was established by the law firm of Wilmer, Cutler & Pickering as a service to the members of the Dealer Bank Association, a trade association for commercial banks.

"There were just so many operational people in the banks [who] either didn't have access to the regulations or found them absolutely impenetrable in trying to read them that we were just trying to provide a service," David Lake, a tax partner with the law firm, explained. "It has ended up being a tremendously popular service. We get an incredible number of calls on it."

Surprisingly, the number of calls has not increased in recent weeks with the increase in talk about repealing the 10% withholding provision of Tefra. "Most banks, I honestly believe, think it is going to be repealed and aren't worrying about the technical questions," Lake said.

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## DP Managers Betting on Tefra

(Continued from Page 1)

"At first, I did not realize the scope of it," John Gibbs, president of Southwest Data Services of Fort Myers, Fla., admitted. "Over time, I realized that we really had a much greater problem than we first expected. I'm not sure it's not going to be a bear for a long time. By the time we get it cleaned up, it's going to be a kodiak."

"It became much more complicated than it had to be with all of the exceptions," according to the DP manager of a major Northeastern bank, who declined to be identified. "If you look at the progress of the law through Congress, you can surmise that there is a chance it will be changed again and again."

Such vacillation has created motivation problems for many DP managers, who question whether their best programmers should devote much time to writing a system that may never be used. "It's pretty hard to get excited about this project when all the time half the people are telling you it's never going to be employed," Gibbs said.

"Trying to motivate a group of systems analysts under those conditions is extremely difficult," commented Jack Grantham, vice-president of the Trust Systems Group at the Bank of America in San Francisco. "Plus, we have had an extremely difficult time getting specifications. We still don't have all of the specifications on reporting."

As a result, some DP shops are scaling down their development efforts in order to meet minimum requirements if the law is enacted July 1. No matter what happens, some elements of the measure are likely to be enforced, managers indicated.

"The entire thing is not going to be repealed," Grantham said. "There are various proposals regarding the backup withholding that would still be in force. We would have to figure out what the ramifications of that would be for us."

Some of the managers are looking for and finding a silver lining. Southwest Data Services has committed 12 man-months to the project, and "about 98% of what we have done so far we will be able to use whether or not the law is repealed," Gibbs noted. The mandated modifications gave the company the chance to install new versions of software that also incorporate the new code.

But he added that the company has shelved two priority projects to devote itself almost completely to Tefra.

"Our resources have been employed on modifications and upgrades that have nothing to do with where we'd like to be putting our people to work," he said.

Richard Biggs, vice-president of information development and applications at Provident Savings Bank in Baltimore, said Tefra gave his shop a good opportunity to try out packaged applications. His department programs mostly in assembler code, but "we would like to get back on the Cobol, [IBM] CICS bandwagon."

To comply with the Tefra regulations, Provident Savings bought a package from Disc, Inc.

## Congress Scrambling to Reach Tefra Accord

As the July 1 implementation date approaches for the controversial provision of the Tax Equity and Fiscal Responsibility Act (Tefra) that requires financial institutions and corporations to withhold 10% of interest and dividend payments, legislators are scrambling to reach a compromise on which the U.S. House of Representatives, the Senate and President Reagan can agree.

The Senate is scheduled this week to take up a measure already passed by the House (H.R. 2973), which would repeal the law's "withholding at the source" provision. The Senate had earlier sent a tariff bill to the House, which included an amendment repealing the Tefra withholding provision and substituting a

compromise that would have rolled back the implementation date for four years.

However, since revenue measures must originate in the House, the bill was returned to the Senate without action, a House Ways and Means Committee official said.

If the Senate passes the measure repealing the controversial Tefra provision, the measure will go to President Reagan. However, several senators have proposed amendments to the repeal bill which, if attached, would complicate the bill and force a conference committee of selected House and Senate members to attempt to reach a compromise.

"It would probably really drag out the battle as to whether we repeal it

or not," the official said.

If a compromise is reached, the measure will then have to go back through the House and Senate and then be passed on to President Reagan. Reagan, however, has indicated he will veto any attempt to kill the withholding measure.

It is uncertain whether opponents of the bill in Congress have enough votes to override a veto, the House Ways and Means official said.

Even if the withholding provision goes into effect, its impact on financial institutions will not be immediate, the official noted. Institutions are technically required to begin automatic withholding July 1, but are not required to report the figures until the end of the year.



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## From High End to Low End

# ICA Product Introductions Span the Spectrum

By Jim Bartimo

CW Staff

ANAHEIM, Calif. — While Western Union passed out yo-yos on the exhibit floor, product introductions at the International Communications Association's (ICA) 36th Annual Conference and Exhibition here last week ranged from high-end communications devices to a low-cost message terminal.

A multiuser desktop computer designed for communications managers was introduced by Sykes Data-ronics, Inc. The Genus-GC Group Computer performs traditional data processing functions and permits interfacing with existing data streams

## CW at ICA

and formats for more effective data handling, a vendor spokesman said.

The microcomputer runs a Unix-like operating system from Sykes called OS9 and can network through a public branch exchange. It includes 256K bytes of main memory, an 8-in. floppy drive and a 5¼-in. Winchester drive.

Available during the fourth quarter of this year, Genus-GC will cost \$9,455 without software. Sykes is based at 159 E. Main St., Rochester, N.Y. 14604.

A handful of message terminals were introduced here at ICA, among them the Winc Messenger from Mohawk Data Sciences Corp. Designed to work with the company's World-wide Integrated Communications (Winc) Electronic Mail Service, the terminal is said to reduce telex costs.

The Winc Messenger features 32K bytes of local main memory for message buffering and on-screen editing, a vendor spokesman said. It will receive 6,000 char./min and spool messages to an 80 char./sec printer. Available in September, it will cost \$5,995 from Mohawk Data Sciences, 7 Century Drive, Parsippany, N.J. 07054.

While few multiplexers were introduced at the show, Paradyne Corp. enhanced its DCX series of statistical multiplexers to increase throughput and allow interfacing to IBM terminals in a DCX network. A High-Speed Composite Link Card was introduced for the DCX 840/850 multiplexers that reportedly allows data transmission speeds of 56K bit/sec.

The Bisync Channel Card was also introduced for the same line of multiplexers. It allows users with IBM's Binary Synchronous Communications protocol and asynchronous devices to combine the two types of data on the same line at 1,200 to 9,600 bit/sec, Paradyne said.

The 56K-bit link card is available for \$2,500; the bisync card costs \$1,200. Paradyne can be reached through P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 33540.

Compression Labs, Inc. introduced a compact video teleconferencing system said to eliminate the need for a specially designed teleconferencing room. The Mini Conference System (MCS) includes a color monitor and camera for motion video and audio, a portable graphics unit and a movable stand that houses the system.

A hand-held controller provides video and graphics selection, audio volume, privacy modes and camera control. The MCS can operate at various motion video rates from 384K bit/sec to 2.048M bit/sec or a still frame of 56K bit/sec, according to Compression Labs.

One MCS can be connected to another over a local broadband network beginning in the first quarter of 1984. The system will cost \$35,000. Compression Labs is headquartered at 2305 Bering Drive, San Jose, Calif. 95131.

## Seminar to Offer Disaster Plans

ROLLING MEADOWS, Ill. — The disaster recovery plan that enabled Northwest National Bank of Minneapolis to recover from the 1982 Thanksgiving Day fire that all but destroyed its headquarters will be the focus of a two-day seminar designed to help institutions prepare for and recover from catastrophes.

Sponsored by the Bank Administration Institute (BAI) in conjunction with Northwest National Bank of Minneapolis, the workshop is scheduled for June 9-10 at the Radisson South in Minneapolis; Sept. 12-13 at the Baltimore Hilton in Baltimore; and Oct. 24-25 at the Amfac Hotel and Resort in Dallas/Fort Worth.

Workshop sessions will be conducted by members of the bank's recovery planning team, according to a spokesman.

Registration costs \$425 for institute member banks and \$550 for others. Further information can be obtained from Stephen M. Rowe, Director of Technical Programs, Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

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# Union Oil Tells How It Avoided Micro Chaos

By Jim Bartimo  
CW Staff

ANAHEIM, Calif. — The acquisition of personal computers within a corporation can often result in chaos when users discover that their machines cannot communicate with the corporate mainframe or with other micros. But a strategic plan can prevent this high-tech Tower of Babel — at least it did at Union Oil of California, according to the senior computer services planning adviser there, Robert E. Dolan II.

Dolan outlined that plan here last week at the 36th Annual International Communications Association (ICA) Conference and Exhibition. Among the regulations suggested by the plan was standardization of oper-

## Technology Society To Meet June 20-22

CHICAGO — The Technology Transfer Society will hold its eighth annual meeting and International Symposium here June 20-22 at the IIT Research Institute.

The theme of the conference is "People Interaction." Sessions will cover technology transfer topics, including international, industrial/commercial, university involvement, licensing and legal considerations and state and local government.

The registration fee is \$150 for members and \$185 for nonmembers. IIT Research Institute can be reached at 10 W. 35th St., Chicago, Ill. 60616.

ating systems and communications protocols for specific applications. On the division level, vendor-specific machines were recommended to departments.

How did Dolan arrive at these standards? A team of testers and input from information processing departments, such as office automation, played roles. Pilot projects still are testing new products, Dolan said.

Dolan tested many of the machines available on the market for an initial study. "We took a 'no-future' policy that forced us to close our eyes to what was coming out in the future," he said. "Vendors wanted to sell us the future, but we were only interested in what would work for us today. If it didn't work for us, it didn't work."

Once the testing was under way, Dolan's study had to define the parameters of a personal computer.

Admitting the limitations of his definition, Dolan listed these attributes of a personal computer:

- A typewriter keyboard.
- 64K bytes or more of main memory.
- Two floppy disk drives.
- A printer.
- A communications port.
- A 24-line by 80-col. display.

"This eliminated the [Commodore Business Machines, Inc.] Commodores and the [Warner Bros.] Ataris," Dolan observed.

Finding that remote terminals, calculators and word processors all

## CW at ICA

contained at least some elements of a micro, Dolan concentrated on "personal computing rather than personal computers."

Pointing to the superior communications capability of a local processor connected to a minicomputer, Dolan said, "Personally, I think this is the direction in which personal computing is moving."

In his study, Dolan next defined what a personal computer can do for a corporation. Foremost among its capabilities are word processing and electronic spreadsheet analysis. "I settled on [Micropro International Corp.'s] Wordstar for word processing," Dolan said, "but it took on different looks depending on the hardware. For instance, it was horrible on the [Osborne Computer Corp.] Osborne."

Dolan found that data base management and communications protocols were better than expected, but still not perfect. "The two major factors holding personal computers back is that the data is not structured, and the communication is not there yet."

Areas in which personal computers were not strong were data entry, scientific processing, graphics and with nonkeyboard input devices, Dolan said.

One of the more innovative ways



CW Photo by J. Bartimo

When Union Oil of California began to look at personal computers, 'vendors wanted to sell us the future, but we were only interested in what would work for us today,' Robert E. Dolan II recalled.

to use personal computers is to put the new lap-size portables from NEC Information Systems, Inc. and Radio Shack on the road, he added.

"These new portables are outstanding for remote entry applications," Dolan said.

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CW Photo by J. Bartino

**'I'm really convinced the technology revolution is still in its infancy,' Theodore F. Brophy, chairman of GTE Corp., told ICA.**

## Communications Deregulation Seen As Helter-Skelter Process by GTE Chief

By Bruce Hoard  
CW Staff

ANAHEIM, Calif. — Deregulation of the communications industry has been and will continue to be a helter-skelter process, according to Theodore F. Brophy, chairman and chief executive officer of GTE Corp.

Brophy, who spoke at the 36th annual International Communications Association Conference and Exposition held here last week, explained how both technological and political elements are frequently unplanned and affect communications deregulation.

Referring to technological change, he said, "I'm really convinced the

technology revolution is still in its infancy" and described research being done toward the eventual development of a private branch exchange that would exist in the form of a semiconductor chip.

Political considerations are just as difficult to forecast as technology changes, Brophy said, adding that new technology has fueled the political controversy around deregulation. "Hopefully, that impact will be beneficial," Brophy commented.

He told his audience that it must participate in the deregulation process. "You must be ready to play an important role in this process while it is being thrust upon you whether

you are ready or not," he stated. It is up to users to help preserve the best elements of the regulated communications environment while also benefiting from the opportunities of deregulation, he said.

If users fail to get involved, there is a chance the telecommunications industry will lapse into its previous monopolistic throes, he added.

Brophy recounted some highlights of telecommunications deregulation to show how political decisions have shaped deregulation. He started with the 1971 Federal Communications Commission (FCC) Computer I decision that assured a clear distinction would be drawn between communications and data processing.

In 1980, the FCC handed down its Computer Inquiry II decision to stimulate competition in those two areas.

"No matter how circuitous the route, it's clear we've come a long way in substituting competition for regulation," the GTE executive noted.

However, several areas of deregulation have yet to be resolved. Brophy pointed to network planning and said there is a need for a new entity to assure consistency and security in times of national emergency. Another area of concern, he indicated, is the deregulation of customer premises equipment, a process involving the transfer of assets from the Bell operating companies to American Bell, Inc., the unregulated AT&T subsidiary.

Brophy noted that the future of network access charges is not clear. Specifically, he mentioned payments that will be made by interexchange carriers and users for connecting local exchange facilities to interexchange facilities.

On another subject, he said the roles of federal and state jurisdiction "can only be resolved by Congress."

Compatibility and interconnectivity are very important to users, and they should lobby for as much flexibility in those areas as possible, he declared.

"You have a key stake in the resolution of these critical issues and undoubtedly in others that will arise in the future," Brophy told his audience.

### Softcon '84 Meet Set for New Orleans

BOSTON — Northeast Expositions has announced that Softcon, an international conference and trade fair for the microcomputer software industry, will be held Feb. 21-23, 1984 in New Orleans.

The conference will be held at the Superdome and reportedly will include more than 1,000 exhibits of microcomputer software products.

In addition, there will be seminars and workshops to brief attendees on new software techniques, analyze trends and predict the future, a spokesman for the conference said.

Further information about Softcon is available from Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

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## Consultant Sees Deregulation Raising — Not Lowering — Costs

By Phil Hirsch  
CW Washington Bureau  
ANAHEIM, Calif. — While one reason for deregulating the U.S. telecommunications industry is to make its products and services more cost-effective for users, the result may be the reverse, consultant Lee L. Selwyn said here last week at the annual meeting of the International Communications Association.

For example, within the next few months, the Federal Communications Commission (FCC) is likely to adopt a plan drafted by AT&T for transferring ownership of all installed Bell terminal equipment to American Bell, Inc. next Jan. 1. "It is reasonable to expect possibly substantial price increases as a result," Selwyn said.

Selwyn contended that increasing rates for existing equipment is one way the AT&T subsidiary can make its newer terminal products more attractive to users. If the older equipment is almost as expensive, the additional features provided by the newer terminals make them appear to be bargains.

AT&T has been accused of using this "migration strategy" in numerous federal and state regulatory proceedings. Recent FCC and court actions, by deregulating customer premises equipment and transferring it to American Bell,

give the phone company increased freedom to employ the strategy, according to Selwyn. He said that customers who continue to rent customer premises equipment from the phone company will be particularly vulnerable since American Bell, in addition to raising prices on particular equipment at any time, will also be free to terminate maintenance support.

Selwyn contended that although the FCC's December access charge decision reduced interexchange carriers' costs several billion dollars annually, it may not generate similar benefits for users. One reason is that only some interexchange rates are likely to be reduced. Some long-distance rates may actually increase, he observed, because of the Local Access and Transport Areas (Lata) created as part of the AT&T divestiture. In many cases, establishment of the Latas will help increase rates by increasing the physical distance a message has to travel.

Latas may also reduce competition, Selwyn said, explaining that since AT&T has more extensive transmission facilities than its long-distance competitors, the phone company should be able to establish interconnection points closer to many customers and offer lower rates.

## AT&T Executive Predicts Higher Private-Line Rates

By Phil Hirsch  
CW Washington Bureau  
ANAHEIM, Calif. — Private-line rates may increase as a result of the Federal Communications Commission's (FCC) recent access charge decision, an assistant vice-president of AT&T's Long Lines Division told attendees of the International Communications Association's (ICA) annual conference here last week.

But, he added, several new services are on the way.

Lawrence Garfinkel told the ICA that the FCC's new access charge plan represents "a redistribution of charges ultimately intended to relate the price charged for access directly to the relevant costs of providing that service." While private-line rates are likely to go up as a result, he said he expects Message Toll Service (MTS) and Wats rates to come down.

Regarding new services, Garfinkel said, "Our network is rapidly evolving into one of widely available digital connectivity." The new offerings made possible by this added capability include "high-capacity digital services, packet transport services, further evolution of the expanded 800 concept, innovations in teleconferencing, Dataphone Digital Service improvements and optional MTS discount calling plans."

Garfinkel was part of a panel that discussed the impact of AT&T's impending divestiture. Another speaker,

### CW at ICA

attorney John Bryson, former president of the California Public Utilities Commission, said state regulatory agencies will limit bypass services to keep local telephone companies financially healthy. The regulators believe this is the way to prevent a sharp rise in local rates for residential users, he explained.

Bryson pointed to the fight between Cox Cable TV and the Nebraska Public Utilities Commission. The state agency maintains that Cox is a common carrier, subject to state regulation, because it provides transmission facilities that MCI Telecommunications Corp. is using to bypass the local telephone network. Cox has asked the FCC to assert jurisdiction.

Many states oppose the FCC's plan to charge all telephone company customers for the costs of accessing the long-distance network, Bryson said. In New York, usage-based charges paid largely by business customers will cover a large percentage of these costs, he said.

Bryson predicted that state regulators will also let local telephone firms offer competitive services and accept higher rates for business-oriented communications services without looking too closely at their cost justification.

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# CAB Study Finds Airline Reservation Systems Biased

By Jake Kirchner

CW Washington Bureau  
WASHINGTON, D.C. — The Civil Aeronautics Board (CAB) has completed its study of airline computerized reservations systems, finding that the systems are biased toward their providers, but the board did not pass immediate judgment on the seriousness of that bias.

In sending its report to Congress late last month, the board listed as possible options for future action: a continued investigation to gather more information on the systems practices, deferring to the Justice Department's simultaneous investigation of the same subject, or instituting CAB rule-making or enforcement procedures based on al-

legations of unfair and anticompetitive actions by the systems' providers.

Most travel agents use systems of a few major airlines, which can also be used to book flights on competing carriers.

Widespread allegations have surfaced that the present systems are tailored to benefit the providers and, in some cases, harm competitors [CW, May 2].

According to a CAB spokesman, the emphasis of future action "will not be on whether bias exists in computerized reservations systems —

that's a given; it does — but on whether the level of bias is acceptable and compatible with airline deregulation."

In a separate statement, CAB members James R. Smith and Gloria Schaffer advised Congress that enough evidence has been compiled by the board staff to begin a rule-making procedure aimed at curtailing the inherent bias in the major reservations systems.

American Airlines and United Airlines currently provide the systems most commonly used in this country.

## Washington Update

### Reagan Endorses Hot Line Upgrade

WASHINGTON, D.C. — President Reagan has endorsed a Defense Department study recommending upgrading the "hot line" linking the U.S. and the USSR and used in times of emergency and international tension.

Among those recommendations, announced by Defense in late April, was a plan to add a high-speed facsimile capability to the hot line, more properly known as the Direct Communications Link [CW, May 2]. The system now consists of teletypewriter terminals linked by satellite with a backup telegraph circuit.

The White House said the president has also endorsed recommendations to institute more sophisticated links between U.S. and Soviet military commands and between embassies of the two nations. The report, with the president's endorsement, now goes to Congress for action.

### Summit Embraces Plan For International R&D

WILLIAMSBURG, Va. — The summary declaration at the conclusion of the recent summit meeting of President Reagan and the leaders of the U.S.' major industrial allies endorsed a program of international cooperative research and development.

"We are agreed upon the need to encourage both the development of advanced technology and the public acceptance of its role in promoting growth, employment and trade," read the declaration, issued last Monday at the close of the meeting between the leaders of the U.S., Canada, Japan, the UK, France, Italy and West Germany.

The declaration endorsed the report of a group of government officials established at last year's summit at Versailles, France. Prior to the meeting here, that group proposed 18 specific cooperative research and development projects in the fields of advanced science and technology and their effects on education, training and culture [CW, April 25].

### GAO: Software Developed In-House Ups U.S. Costs

WASHINGTON, D.C. — Almost all federal agency applications software is developed in-house, according to the U.S. General Accounting Office (GAO), which said the failure to purchase off-the-shelf programs needlessly increases government DP costs.

Reporting its findings to the Office of Management and Budget and to the General Services Administration, the GAO said that more than 98% of the application software inventories, of 15 agencies visited as part of the study, had been custom developed, either by agency staff or contractors.

GAO auditors also obtained information from 248 other federal DP sites and from 146 software vendors through questionnaires.

The report said the 15 sites had acquired about 1% of their applications software inventory off the shelf.

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## Commonality of Interests Beneficial IBI Chief: Third World, Europe Share Interests

By Jake Kirchner

CW Washington Bureau

HAVANA, Cuba — Although Third World countries are the most obvious outsiders in the Information Age, the ranks of the high-technology underprivileged actually include every nation except the U.S. and Japan, the head of the Intergovernmental Bureau for Informatics (IBI) said recently.

This situation implies a commonality of interests for many countries struggling to catch up to the U.S. and Japan, which can be exploited for both economic and developmental benefits, according to IBI Director General Fermin A. Bernasconi.

Addressing a recent IBI conference here on Third World informatics development, Bernasconi asserted that 98% of all research and development investment in this field — which includes the entire range of data processing, telecommunications and information technologies and services — is made in just two countries. "This means that developed countries, such as the European countries, are also to be counted among the countries that will be seriously affected by this exponential phenomenon of informatics and which will lag behind the U.S. and Japan," he said.

Bernasconi explained his use of

the term "exponential phenomenon" by saying informatics is a technological development that "becomes increasingly accelerated and which allows for the introduction of this technology in each and every human activity."

He said informatics is "a necessary — although not sufficient — condition for the development and sovereignty of our developing countries."

In the Third World, he added, informatics has long been recognized "as a profound political phenomenon rather than just a technological one."

Bernasconi said that most developed and developing countries need more rapid technological development and are slowed in the pursuit of that goal by the current global economic downturn. He sought to identify

(Continued on Page 16)

### IBI Meet a Golden Opportunity For Some Systems Vendors

HAVANA, Cuba — While most of the major multinational vendors of DP and telecommunications equipment and services stayed away — for obvious political reasons — from the Intergovernmental Bureau for Informatics' (IBI) recent Third World meeting on informatics here, some firms saw the gathering as a golden opportunity to expand their market shares.

As delegates from three dozen nations deliberated in a cavernous hall of Cuba's International Conference Center, representatives from several almost exclusively European firms cornered delegates in the corridors, back rooms and lobby, pushing systems and services they said are ideally suited for developing nations.

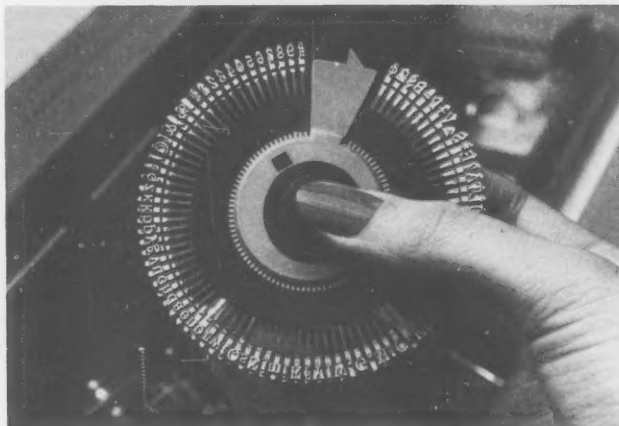
Two of the more active corporations were Italy's giant Olivetti and the software/systems company Italsiel, which have teamed up to market two systems directly tailored to developing nations.

Representatives of the two firms said they see participation in the IBI's special informatics development program for the Third World as the chance to garner millions of dollars in new sales.

Paolo Sigillo, vice-director general of Italsiel, said the IBI program, aimed at bringing together developing nations with suppliers in specific high-technology projects coordinated by the IBI, is "a bridge to deliver informatics culture to these countries."

(Continued on Page 16)

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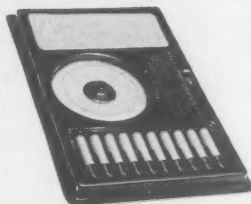
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# IBI Chief: Third World, Europe Share Interests

(Continued from Page 15)

tify a commonality of interests between the two sectors. This situation should, he explained, "give rise to a worthier form of international cooperation, where it is not the case of one party paternally giving and the other thankfully receiving, but of co-operation."

This is the basis for the present efforts of the Rome-based, primarily Third World IBI, which is promoting a \$1 billion special informatics development program to join systems and services vendors, international financial sources and developing countries in a series of specific informatics projects [CW, May 30].

The IBI sees the program as putting the developed and developing

world on a less confrontational course, at least in the area of informatics. The program, Bernasconi said, will involve "no more alms, no more dispensing and thanking, but rather a relationship on an equal footing with clear-cut, evident and harmonious interests."

The program, its supporters argue, is equally beneficial to the developed nations. It could be "the catalyst in the opening of a great market," Bernasconi said, adding that the international informatics market equals \$50 billion a year. Developing countries account for approximately 4% to 5% of that, he added, amounting to about .2% to .3% of their gross domestic product, which is roughly 10% of the investment in informatics com-

mon to developed nations.

Suggesting that Third World countries should immediately move to increase their outlays to the equivalent of 1% to 1.5% of their gross domestic product, Bernasconi argued that any effective program will tremendously benefit suppliers of the necessary technology. The result, he explained, would be to increase the informatics market in the develop-

ing countries from \$2 billion to \$3 billion annually to \$10 billion to \$12 billion a year.

While the IBI hopes to include the U.S. and Japan in its program at some point, Bernasconi said that the undertaking "offers countries with an average informatics development — developed countries other than the United States and Japan, in particular — a unique opportunity."

## Firms Push Sales at IBI Meet

(Continued from Page 15)

tries." Not incidentally, he added, "we are pretty well-assured there is a large market for the two firms' products."

The specific products they pushed at the meeting were a hospital automation system, covering everything from payroll and inventory to patient records and billing, and a system to automate the operations of municipal governments.

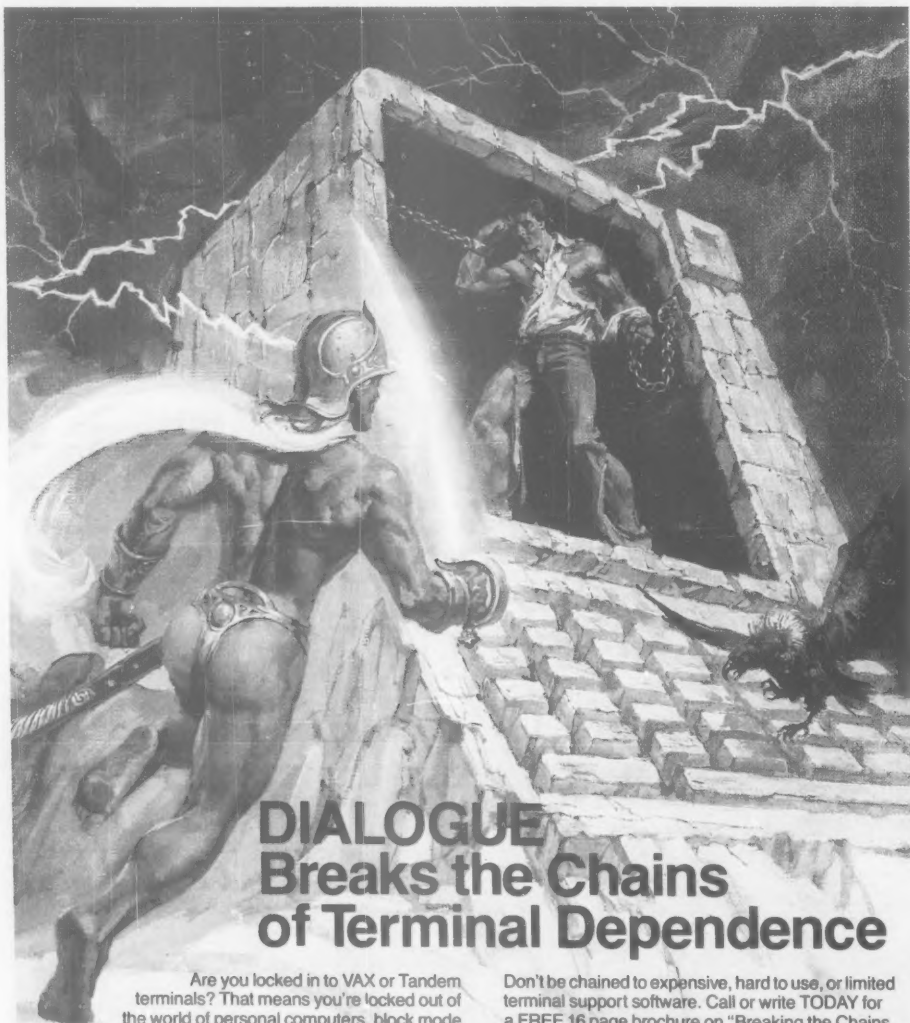
The hospital system has already been installed in 400 facilities in Italy, according to the firms. Antonio Beninati, Olivetti market development manager, said the system is based on his firm's 16-bit, 4M-byte SP600/44 processor and software developed by Italsiel.

Because the IBI insists on complete technology transfer in any project it includes in its informatics program, the organization will verify the competence of or will help establish a software house within any country desiring the two firms' system. The software houses will be responsible for adapting the software for local needs.

In addition, IBI technical personnel will verify the suitability of the companies' specifications and has already visited existing installations of the hospital system.

Through the technology transfer, IBI hopes, the project will fill two needs at once: the Third World need for sophisticated hospital automation and the need to foster indigenous technological capabilities in developing countries.

The two firms will train, in Italy and locally, any operations and management personnel the systems require. Local training will be handled through Olivetti subsidiaries, and new subsidiaries will be established if none exist already.



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# Survey Shows IBM's VM Gaining on MVS

By Lois Paul  
CW Staff

FRAMINGHAM, Mass. — A survey of 683 IBM sites nationwide revealed that almost as many CPUs were running IBM's VM/370 operating system in 1982 as were using MVS, although VM's popularity still rests among different segments of the IBM mainframe population.

IBM's premier operating system, OS/VS2 (MVS), has enjoyed "steady, but undramatic" growth and did not significantly enter new shops in 1982 the way it did in the past.

These were two findings of International Data Corp.'s (IDC) 1983 "IBM Software Environment" report.

About 21% of the survey respondents were running VM/370, an increase of over 4% in one year. "VM has even managed to capture a share of the 30 [series] marketplace that it never had before," the researchers noted (see figure above).

Year-end 1979 figures indicated that 14% of the survey sites used the IBM MVS operating system. Two years later, this percentage rose to exactly 21% for all of the machines in IDC's sample. At

CPU	IDC Resp.	DOS	%	DOS/ VS	%	DOS/ VSE	%	OS/ VSI	%	MVS/ SP	%	MVS (No SP)	%	Oth- er	%	VM/ 370 Only	%	VM/370 + 1 Guest	%	VM/370 + 2 Guests	%
Sys/360	13	10	76.9	1	7.7	-	-	-	-	1	7.7	-	-	1	7.7	-	-	-	-	-	-
370/115	5	-	-	4	80.0	1	20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
125	9	-	-	7	77.8	2	22.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
135	9	3	33.3	4	44.4	2	22.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
138	36	1	2.8	12	33.3	17	47.2	-	-	-	-	-	-	1	2.8	1	2.8	3	8.3	1	2.8
145	8	-	-	2	25.0	4	50.0	-	-	-	-	-	-	-	-	-	-	1	12.5	1	12.5
148	36	-	-	6	16.7	19	52.7	2	5.6	-	-	-	-	2	5.6	2	5.6	5	13.8	-	-
155	4	1	25.0	-	-	-	-	1	25.0	-	-	-	-	2	50.0	-	-	-	-	-	-
158	48	1	2.1	1	2.1	4	8.3	5	10.4	8	16.6	11	22.9	2	4.2	2	4.2	13	27.1	1	2.1
165	1	-	-	-	-	-	-	-	-	1	100.0	-	-	-	-	-	-	-	-	-	-
168	24	-	-	-	-	-	-	-	-	13	54.2	7	29.2	-	-	1	4.2	3	12.5	-	-
SUBTOTAL	180	6	3.3	36	20.0	49	27.2	8	4.5	22	12.2	18	10.0	7	3.9	6	3.3	25	13.9	3	1.7
4331	190	5	2.6	9	4.7	148	77.9	2	1.1	-	-	-	-	3	1.5	6	3.2	15	7.9	2	1.1
4341	339	-	-	3	0.9	146	43.1	26	7.7	48	14.1	4	1.2	5	1.5	8	2.3	89	26.3	10	2.9
SUBTOTAL	529	5	0.9	12	2.3	294	55.6	28	5.3	48	9.1	4	0.7	8	1.5	14	2.6	104	19.7	12	2.3
3031	39	-	-	1	2.6	4	10.3	7	17.9	19	48.7	2	5.1	1	2.6	-	-	3	7.7	2	5.1
3032	6	-	-	-	-	-	-	2	33.3	3	50.0	1	16.7	-	-	-	-	-	-	-	-
3033	63	-	-	-	-	1	1.6	3	4.7	35	55.6	12	19.0	2	3.2	1	1.6	7	11.1	2	3.2
3081	22	-	-	-	-	-	-	-	-	20	91.0	1	4.5	-	-	-	-	1	4.5	-	-
SUBTOTAL	130	-	-	1	0.8	5	3.8	12	9.2	77	59.2	16	12.3	3	2.3	1	0.8	11	8.5	4	3.1
TOTAL	852	21	2.5	50	5.9	348	40.8	48	5.6	148	17.4	38	4.5	19	2.2	21	2.5	140	16.4	19	2.2

IDC Chart

In the table above showing the distribution of operating systems on IBM 360, 370, 30 series and 4300 series proces-

sors as of December 1982, the 'other' category includes OS/MFT and OS/MVT as well as Edos.

the close of 1982, approximately 22% of the sites reported that they were running MVS.

The surveyors found no appreciable increase in the percentage of sites running data base management systems (DBMS). IBM's IMS and DL/1 were being used at 58% of the sites with DBMS soft-

ware installed. Cincom Systems, Inc.'s Total product proved to be the most popular independent package among these users, although the survey indicated that its overall share is declining. Cullinet Software, Inc.'s IDMS product was shown to be an increasing presence at IBM sites, as were DBMS of-

ferings from Applied Data Research, Inc. and Software AG of North America.

IBM's CICS was the teleprocessing monitor being run at 83% of the sites polled. Among the products from independent vendors, Cincom's Environ/1 garnered the next highest share of the market. IBM's Interactive

Computing Control Facility proved to be the most popular product used for in-house time-sharing. Just under 40% of the sites surveyed were running this software, reflecting its popularity among IBM 4300 users, the surveyors noted. IBM's TSO maintained its presence in the (Continued on Page 18)

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## Logic Users Meet Set for June 12

DALLAS — Logic, Inc. will hold its annual users conference on June 12-14 here at the Dallas/Fort Worth Airport Amfac East Hotel. Workshops will be conducted on the IBM Personal Computer, vendor single interest administration, claims and credit administration, new industry products and managed companies.

The company will also demonstrate the capabilities of its Pro Forma software for the IBM Personal Computer and Clas-ic Credit integrated credit administration system, a vendor spokesman said.

General registration for the conference is \$150, Logic said from 1100 Stemmons Tower S., 2720 Stemmons Freeway, Dallas, Texas 75207.

## Minn. Shuts Down Pyramid Sales Scheme

ST. PAUL, Minn. — A pyramid sales scheme that boasted it used a computer to ensure fair payment for members' recruiters has been shut down in Minnesota, and the promoters have been fined \$31,000, the state Attorney General's office has announced.

Computerized Markets Co. of Denver said it recruited between 600 and 800 members in Minnesota for a discount coupon offer, which the Attorney General's office said was a thinly disguised cover for the recruiting scheme. Members paid a \$96 fee purportedly to receive discounts at business establishments and the privilege of buying discount items through a catalog.

Members were also asked to recruit others in exchange for a per-

centage of their membership fees. Members who reached the top levels of the pyramid were promised over \$54,000 in commissions. The company said that fairness was ensured because the fees and commissions were tracked by a computer.

Witnesses at an April hearing testified that Computerized Markets did use data entry terminals as promised, but the legitimacy of the company's claims apparently ended there, according to Dwight Wagenius, special assistant attorney general.

The firm was unable to produce sufficient evidence that the promised discounts actually existed.

"Their sales brochure listed some discounts," Wagenius said, "but the sales were made in Minnesota, and

all those discounts are available in Denver."

Wagenius added that no more than 12 copies of the promised discount catalog were ever produced.

## Report Covers Micro Security

PLYMOUTH, Mich. — Computer Protection Systems, Inc., a consulting firm specializing in information systems security, has announced a special report addressing security in a microcomputer environment.

Called "Managing Microcomputer Security," the report covers a variety of microcomputer security issues including site, hardware, software, data base and communications security. Also addressed are audit considerations, including journals and logs, I/O controls, processing controls and distributed data processing controls.

Insurance for microcomputers and legal issues, such as copyright laws, software piracy and privacy are also covered, the vendor said. In addition, the report deals with preventative maintenance and disaster preparedness and recovery, according to the spokesman.

The report costs \$15 from Computer Protection Systems, Suite 4, 711 Ann Arbor Trail, Plymouth, Mich. 48170.

## IDC Poll Shows Use of VM Up

(Continued from Page 17)  
marketplace by having installed 18% of the programs mentioned by the respondents.

Over 73% of the shops in the sample indicated that they primarily used IBM's Vsam file access method. Over 10% of the sites polled reported they were using Isam as their access method.

Twenty percent of the IBM 4300 sites sampled reported they have installed or expect to install IBM's Distributed Office Support System (Disoss) by the mid-1980s.

Another 35% of the IBM 30 series shops polled this year mentioned that they will be running Disoss sometime later than 1983, according to the study.

The surveyors noted that by the end of 1983 almost 29% of the 683 shops surveyed intend to establish an information center.

Fifty-three percent of the current IBM 30 series sites that were sampled expected to set up information centers by the end of 1983, according to the IDC report.

The IBM Migration Census/Study was mailed to 17,000 sites across the country in October 1982 to study the intentions of IBM customers regarding processor acquisitions, financing methods, major peripherals, memory upgrades and software usage. Information gained from this survey was incorporated in the "IBM Software Environment" study, which is available from IDC for \$3,000.

More information on the report is available from IDC, which is located at Five Speen St., Framingham, Mass. 01701.

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# Senate Panel Eyes Laws for NCIC Regulation

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — A Senate subcommittee, voicing concern about privacy protection amid growing use of the Federal Bureau of Investigation's National Crime Information Center (NCIC) data banks for employment and licensing background checks, recently indicated that legislation may be needed to set policies and practices for NCIC operations.

The Judiciary Subcommittee on Patents, Copyrights and Trademarks, which has jurisdiction in some privacy areas, was urged by the Congressional Office of Technology Assessment (OTA) at a recent hearing on the NCIC to consider such legislation. OTA recently completed a study of NCIC involvement in the national exchange of computerized criminal history (CCH) information [CW, Nov. 1].

"Legislation appears to be the most appropriate vehicle for guiding the full implementation of a national CCH system . . . in a way that will enhance the efficiency and effectiveness of the criminal justice process, protect privacy and constitutional rights and properly balance the roles and responsibilities of the federal and state governments," Fred B. Wood, OTA project director, told the subcommittee.

The FBI is currently developing a so-called Interstate Identification Index (III) to decentralize CCH exchange. Under this plan, which is operating in 15 states, the FBI would maintain an index to federal and state records. Local law enforcement agencies seeking this data would check the index to see what other government bodies have records on specific individuals.

According to the plan, if such records exist, the FBI would notify the inquiring state and the state with the records, which would then arrange for the record transfer independent of the NCIC. While the idea of decentralizing the CCH exchange system is widely applauded, all parties involved note that decentralization alone does not solve long-standing questions about CCH systems.

Among the more important questions are the proper role of the FBI in nonfederal CCH exchanges, how to ensure full and accurate CCH records and to what extent the system should be available for noncriminal justice use, such as for checking the backgrounds of individuals seeking employment and licenses.

## Substantial Impact

According to the OTA study, requests for CCH information constitute almost 20% of total requests to state and federal CCH repositories, and seven out of 45 states polled reported that figure to be more than 40%. Because an estimated 36 million Americans — about 30% of the total work force — have criminal history records, which include instances of acquittals, nonprosecutions and convictions, the OTA remarked that "the impact of record dissemination on individual privacy and employment prospects could be substantial."

The problem is compounded by the fact that states differ in their ap-

proach to noncriminal justice use of these records. Some states regulate it by statute; some do not allow it; and in some states, criminal records are completely open to the public. The OTA's Wood suggested there are some common features among state laws that could be the basis for federal legislation, which, he said, could also be useful for setting minimum national standards for CCH use that would be "reasonably consistent" with existing state laws.

## Noncriminal Justice Access

Noting that the current III project does not permit noncriminal justice access, Wood said the issue must be resolved because if this access remains prohibited, the FBI would be

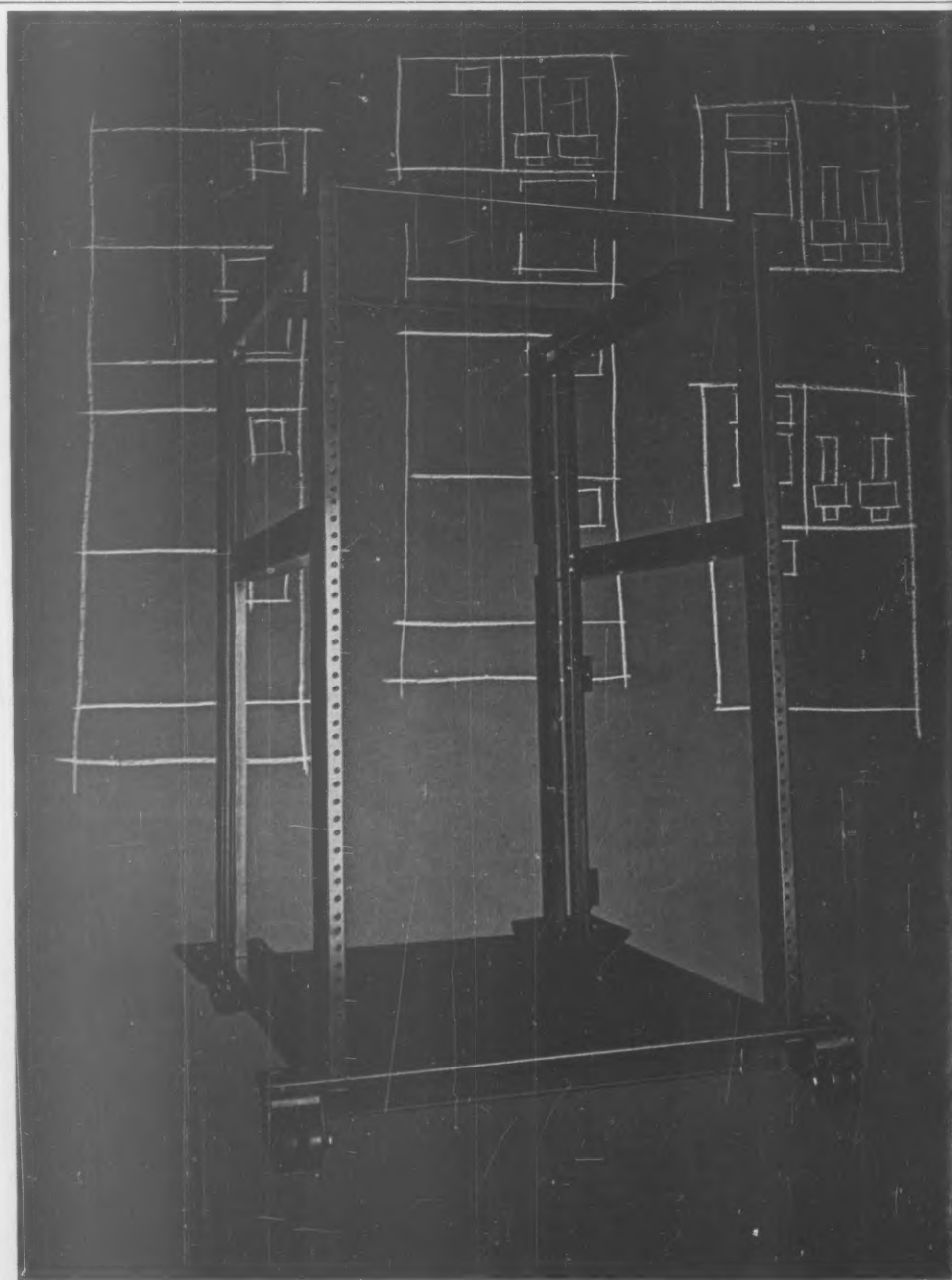
required to maintain a separate record file for this purpose, which would defeat the III objective of decentralization. If it is allowed, he added, noncriminal justice requests for information "can overburden record repositories to the point where efficiency is compromised."

Kier T. Boyd, head of the FBI Technical Services Division, said the Senate subcommittee's inquiry into NCIC operations and policies is welcome. NCIC Section Chief David F. Nemecek told the subcommittee that the FBI has awarded one contract to a consultant and is considering a second contract proposal to look into the issue of noncriminal justice NCIC access.

Subcommittee Chairman Sen.

Charles Mathias Jr. (R-Md.) called this access a "thorny" question that "must be resolved if the national criminal history information system is to function effectively." He said the privacy concerns raised in this issue are part of the "dark side" of the need in a mobile society for an effective, accurate and secure CCH exchange system.

Mathias said legislative efforts in this area over the last 13 years "bore little fruit." For the last several years, "the agencies and the states have had to tackle by themselves the challenges posed by new information technologies and by new demands on criminal justice systems, with scarcely a hint of guidance from the national legislature," he said.





## Law Professor Advocates Limited Access

WASHINGTON, D.C. — Established constitutional and social traditions argue for restricted access to computerized criminal history information for employment and licensing purposes, according to an information technology law expert.

Commenting on the growing practice of using police data banks, particularly the Federal Bureau of Investigation's National Crime Information Center, to perform background checks on candidates for jobs or licenses, Prof. George B. Trubow said that, in general, criminal history data should be open to the public.

"There are, however, two major constraints that militate in behalf of the restriction of access to certain kinds of [criminal history information]," according to Trubow, director

of the John Marshall Law School Center for Information Technology and Privacy Law, Chicago.

The first constraint, he said, "results from the presumption of innocence which is protected by our Constitution and which I believe is important for a free society." According to this presumption, nonconviction data should not ordinarily be open to the public. If a person is acquitted of charges or not brought to trial, Trubow said, he should not be penalized by the information that he was arrested at some point.

A second constraint, he continued, is the "notion of forgiveness. In support of rehabilitation, society may 'forgive' an individual for certain past transgressions" by keeping that information confidential.

"Opponents of any restrictions on [criminal history record information] often argue that nondisclosure is an attempt to 'rewrite' history by denying that an event occurred," he observed. "That observation is simply not correct and begs the question. The policy issue to be determined is what information about recorded events should be made public, and the confidentiality of selected historically correct information is not a new or radical notion," Trubow maintained.

Trubow said emphatically that federal legislation regulating management of a national criminal history information system is necessary to resolve "the great diversity of criminal records management practices throughout the states."

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CW Photo by R. Batt  
Leslie Scott

## MIS Exec Credited for Turnaround

By Robert Batt

CW West Coast Bureau  
LOS ANGELES — There was no overall management information systems (MIS) plan, equipment was outdated, employee turnover was on the order of 30% and only seven of 18 available programmer and analyst positions were filled four years ago in the MIS department at Knudsen Corp., the \$468 million California-based food

products manufacturer.

Today, the company has converted from NCR Corp. to IBM equipment, developed a five-year MIS plan to give direction to information processing and boosted its staff to 24.

Much of the credit for the transformation has been given to Leslie Scott, vice-president of MIS, who took responsibility for the company's DP efforts in

1979. Under Scott's direction, the MIS department in the last 18 months has converted from a batch-oriented NCR 300 mainframe to an IBM 4331 Model 2 and a 4341 Model 1 running under DOS/VSE. The MIS department also includes IBM's Systems Network Architecture.

As part of that process, Knudsen installed 40 IBM 3278 terminals and four

Model 3262 printers, switched 500 programs from NCR Cobol to IBM Cobol, converted to a DL/1 data base and began using IBM tools such as CICS, Interactive Computing Central Facility (ICCF) and Vtam.

"The NCR environment was simply not attracting the motivated computer professionals that we needed," Scott recalled in a recent interview, "so we decided the first step we must take was to convert to IBM." Once that decision was made in July 1981, the company had eight months to convert before the NCR equipment was due to be removed.

A coordinator was appointed to oversee the conversion and report directly to Scott. Every task, ranging from educating DPs and operators to developing standards for the 4300 mainframes and DOS/VSE operating system, was identified and a schedule set up of what should be done, by whom and when.

Progress was reviewed at weekly meetings, and a documentation library was set up for the first time.

In addition, a new systems manager, conversion manager and operations manager were hired.

### Training DP Professionals

The major problem was to train the company's DP professionals in the new IBM tools before the lease for the NCR equipment ran out. Knudsen set up in-house courses and brought in outside consultants to teach DPs how to use the CICS and ICCF interfaces.

"We have had very few problems since converting," Scott reported. "We did all the parallel runs ourselves and made the conversion completely transparent to the users."

Scott estimated that the conversion, which cost \$159,000, will save the company \$700,000 each year. The new system automates many activities that were previously carried out manually, such as vehicle scheduling by route, inventory selection, monitoring of orders from customers and scheduling production. Users, Scott said, receive more timely information.

More importantly, however, the MIS department's credibility in the company has been restored. Reflecting the support that MIS now receives from top management, Scott was promoted from director to vice-president of MIS and is responsible for overseeing the next wave of automation in the company.

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August 15-19, 1983 ..... New York Area  
September 12-16, 1983 ..... New Orleans  
September 19-23, 1983 ..... New York Area

## CICS/VS PERFORMANCE & TUNING

April 11-12, 1983 ..... Los Angeles  
June 27-28, 1983 ..... New York Area  
August 8-9, 1983 ..... New York Area

## CICS/VS APPLICATION DESIGN

March 21-24, 1983 ..... New Orleans  
April 25-28, 1983 ..... New York Area  
June 13-16, 1983 ..... Chicago  
July 5-8, 1983 ..... New York Area  
July 25-28, 1983 ..... Dallas  
August 29-September 1, 1983 ..... New York Area

## CICS/VS APPLICATION PROGRAMMING COMMAND LEVEL

April 11-15, 1983 ..... New York Area  
May 16-20, 1983 ..... New York Area  
June 27-July 1, 1983 ..... Chicago  
July 11-15, 1983 ..... New York Area  
July 25-29, 1983 ..... Houston  
August 22-26, 1983 ..... New York Area  
September 19-23, 1983 ..... Minneapolis

## CICS/VS APPLICATION PROGRAMMING MACRO LEVEL

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July 5-8, 1983 ..... New York Area  
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September 19-22, 1983 ..... Minneapolis

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April 13-14, 1983 ..... Los Angeles  
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September 6-9, 1983 ..... Houston  
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## VTAM: FROM START TO FINISH

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May 9-12, 1983 ..... Chicago  
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## This Mumps Users Group Catches Commercial Users

By Katherine Hafner  
CW Staff

NEW YORK — Despite its origins in the medical field, the Mumps language has been catching on at commercial sites because of its facility for managing large data bases.

Developed at Boston's Massachusetts General Hospital in the late '60s, the multiprogramming language has until now derived popularity primarily from its application in medical settings. This has not prevented a number of commercial users from capitalizing on Mumps as a flexible and easy-to-use language. A year ago, some of these users in New York, New Jersey and Connecticut formed a local chapter of the national Mumps Users' Group (MUG).

One hundred members strong today, Tri-State (TS)-MUG is the only local chapter of MUG, and its emphasis is strictly commercial.

"Four years ago, there were hardly any commercial applications of Mumps," noted Paul Toretta, vice-president of CDS Systems, Inc. in Elmsford, N.Y., and the founder of TS-MUG. "Now it's becoming very, very commercial, and its applications keep widening."

In fact, although the national MUG remains predominantly medical in its orientation, 80% of the articles in the most recent *Mug Quarterly* were about commercial applications for Mumps.

### Wide Applicability

Part of the appeal Mumps holds for businesses, Toretta said, lies in its wide applicability on minicomputers and even superminis: Digital Equipment Corp., Data General Corp. and the IBM Series/1 mini can accommodate Mumps. In addition, Toretta said, the language can be used on microcomputers based on Intel Corp.'s 8086 and Motorola, Inc.'s 6809 microprocessors.

Mumps lends itself especially well to large banks keeping track of enormous quantities of stocks and bonds, Toretta said.

"The language was written by doctors, who tend to abbreviate everything; so, the language is totally abbreviated," commented Mitchell Bell, a senior programmer analyst at Chase Manhattan Bank in New York.

"Two or three programmers can do in Mumps what would take 30 programmers to do in Cobol. Mumps leaves the programmer time to think about the program instead of worrying about making the system bend for him.

"Here at Chase we maintain two major files," Bell said. "Mumps makes it easy to cross-reference files and pull things out."

Toretta said he formed TS-MUG with an eye toward developing a group that would concentrate on circulating ideas rather than turn into a social gathering. "Our meetings are strictly unsocial events," he said. "We meet every six weeks to share our knowledge of the language."

Members of TS-MUG pay dues to both the local and national groups, but membership in the national group is not required, Toretta said.

Don Ford, a systems analyst at

Malcolm Pirnie, Inc., an environmental engineering firm in White Plains, N.Y., belongs to both the local and national MUGs. For him, TS-MUG is "invaluable for information exchange" among Mumps users.

As for the language itself, Ford believes "Mumps is very good for people who know they're constantly tinkering with their systems. If you need a language to support rapidly changing applications, Mumps will do it."

"We live in a Cobol-Fortran-dominated world," Ford added. "Languages like Mumps will allow people to move away from these two dinosaurs."

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Currently, the automated gas stations hold more advantages for vehicles that are part of a fleet.

## Fully Automated Gas Stations Open

By Jim Bartimo  
CW Staff

PORTLAND, Maine — Signaling what could be the beginning of truly computerized shopping, a fuel station here has begun selling gasoline to customers who pay with a magnetized card similar to those used in automatic teller machines (ATM).

The A.R. Wright Co., based here, has opened two automatic gas stations called Wright Express and plans to open more all over northern New England by next spring, according to Parker Poole III, Wright executive vice-president.

A new type of point-of-sale terminal allows customers to insert a special credit card into the terminal, enter a personal identification code and

fill up their own gas tanks. A receipt is given by the machine, and a monthly bill is sent to the customer.

This is the first application of NCR Corp.'s 1830 Self-Service Fuel Terminal, which is made up of a micro-processor, debit/credit card magnetic strip reader, alphanumeric display, keyboard and receipt printer. "It's part of a line of products that will sell airline tickets, theater tickets and ski lift tickets in the same way," Poole said.

Software parameters are downloaded from a local host processor such as the NCR 2925 Petroleum Management System. In-house data link control is the communications interface between the local host and the 1830, allowing transmission

speeds of 300 bit/sec. The network termination point is at Wright's NCR 8545 mainframe, which handles much of the bill processing.

When a customer logs on the system, his account is checked to ensure that his credit is good. The present application automates the cash transaction from the customer to the dealer, but future applications could put a bank in the middle to draw funds directly out of the customer's account.

This system's advantages currently are mainly for companies that use large fleets of trucks and cars. When the driver of one of these fleet vehicles purchases gasoline, he enters his odometer reading, which allows the system to produce a mile/gallon computation for the vehicle. "You can keep a closer eye on vehicle efficiency as well as on routing," Poole noted. The system will also help eliminate unauthorized use of fuel by employees.

Customers who are not part of a large fleet of vehicles must pay a \$35 fee in order to use the cashless gas station.

The petroleum management software was developed by Cornerstones Energy Group of Brunswick, Maine, a wholly owned subsidiary of A.R. Wright.

### ATM Net Joined by Visa

SAN FRANCISCO — Visa U.S.A., Inc. has joined the group of financial institutions that will offer a nationwide automatic teller machine network (ATM), it was announced here recently. The network, scheduled to begin July 1, will also lay the groundwork for a point-of-sale (POS) network to eliminate further the use of cash.

"You'll be able to access the network with an Electron Visa card or a regular Visa card," a Visa spokesman said. The network will include approximately 8,000 ATMs by 1986 and 1,000 in its first year of operation. The service will use Visa's telecommunications systems and the ATMs of participating Visa members.

The network will allow a Visa card holder to withdraw funds against his account from anywhere in the U.S. and from some foreign countries. "Basically, all you're doing is automating the cash advance system," the Visa spokesman said. "You could take your card to a Visa office today and get a cash advance in the same way."

Perhaps the most significant aspect of this or any ATM network is its potential to include POS terminals and eliminate further cash transactions at retail sites. "We're going to begin a pilot POS network in the fall," the spokesman said. "The idea is to issue as many cards for the ATM network as possible and then start up with the POS."

This strategy to familiarize the public with cashless sales is common among institutions that have announced nationwide ATM networks. These include American Express Co., Master Card and Cirrus Systems, Inc.

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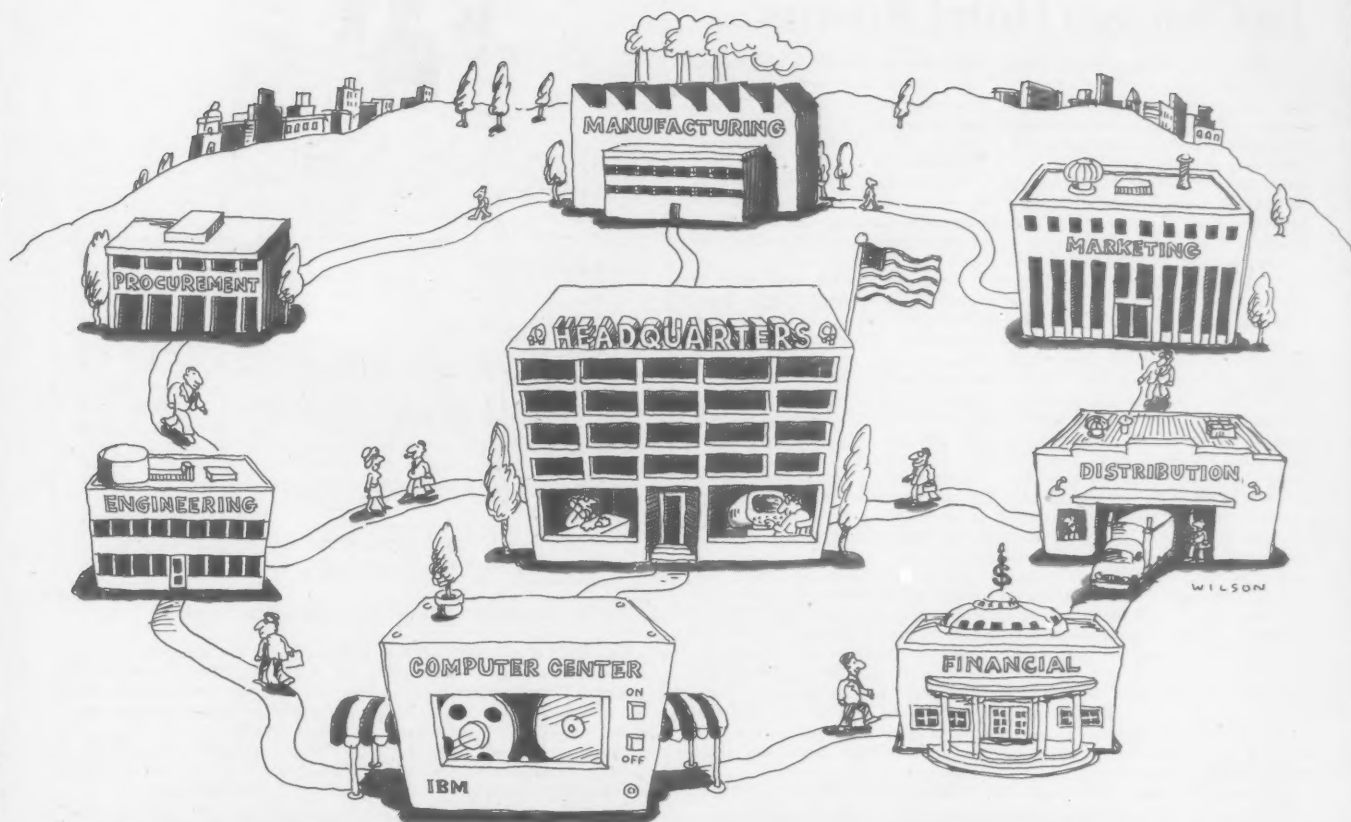
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## Videotex System Premieres In Chicago Hotel Rooms

CHICAGO — Guests at the Midland Hotel here can now elicit more than the standard entertainment fare from their TV sets. Services including airline schedules, news and stock information, electronic mail and games are available on 100 terminals in the first installation of a videotex system marketed by Travelhost, Inc. of Dallas.

Travelhost expects the network to blanket 100,000 hotel rooms by year-end and be carried by satellite, a spokesman said.

The terminals offer on-line, menu-driven access to five data bases, including an on-line version of the Official Airline Guide and a United Press International news/stock wire. Users can also access a Travelhost-provided data base of travel news and make reservations through its travel agency.

Visitors to the Midland hotel access information by using a credit card number and a terminal connected to a television in the hotel room. Communications are through United Telecom Inc.'s Uninet packet-switched digital communications network with the host processor and electronic mail facility provided by ITT Dialcom. Users who are customers of Dialcom can use that company's electronic mail facilities, according to Roger Thraikill, Travelhost's vice-president of marketing.

Four more data bases will be added

by the end of 1983 to offer restaurant menus and reviews, on-line shopping and a list of job opportunities. Dozens of other categories of service are under consideration, Thraikill said.

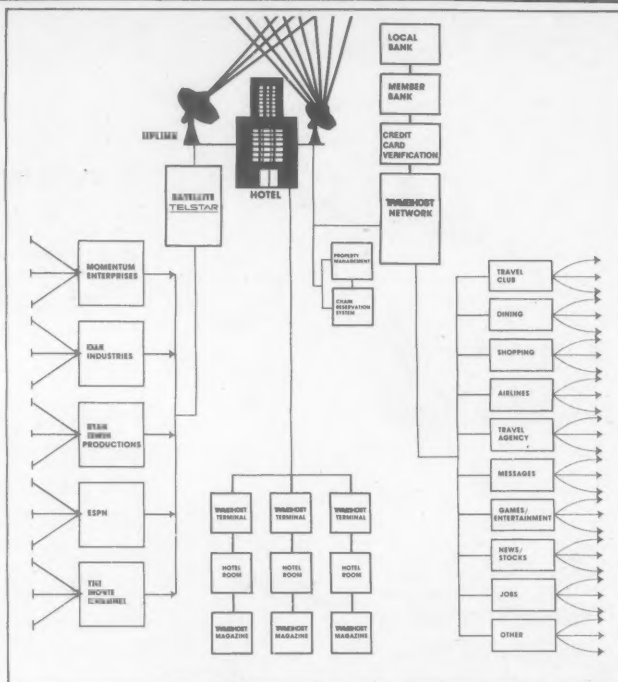
The service costs about \$20/hour at prime time and \$7/hour at evening rates. Member hotels receive a \$1 commission every time the network is activated.

The announcement was hailed as a major one by Bernell Wright, director of videotex services for Link Resources, Inc. of New York. "The Travelhost concept is interesting because it is the first time a businessman can think of traveling as an arm of his company," Wright said. "It provides a very important test case to see how far the concept can go."

Travelhost, which is best known for its *Travelhost* magazine, travel agencies and services, is extending its services to accommodate telecommunications.

Travelhost also manufactures the keypad terminals provided in the hotel rooms and will soon provide the notebook-size machines to members as part of its \$395, two-year membership fee. The company is betting that use of the in-room terminals will spur business travelers to use the portable keyboards to access the Travelhost data base from any telephone.

However, Link Resources' Wright



Travelhost's Planned Communications Network

said he thinks the keypad design, which makes typing cumbersome, may inhibit Travelhost's plans.

"I'd like to see something a little more quality-looking. I also wonder how durable it will be," he said. "It doesn't feel like a good strong terminal," according to Wright.

Although the videotex market is an untested frontier, "the leadership in this industry will be provided by those who get into the market first," Thraikill said.

"If we had waited a couple or three years, it would have happened anyway," Thraikill added.

## DATA FACTORY:

### DATA CENTER OPERATIONS & SYSTEMS DEVELOPMENT

by EDWARD G. ROESKE

The Data Factory presents a scheme for a more effective data center (DC) by encouraging its participation in the development effort. Suggestions include creating the position of operations analyst, to link the DC with other DP groups, and tracking DC performance to spot and resolve problems quickly.

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Buffalo, NY	June 15, 1983	Miami, FL	June 16, 1983	Roanoke, VA	June 21, 1983
Burlington, VT	June 29, 1983	Milwaukee, WI	June 21, 1983	Rochester, NY	June 14, 1983
Chicago-		New Haven, CT	June 21, 1983	San Diego, CA	June 21, 1983
Arlington Hts., IL	July 12, 1983	New Orleans, LA	June 23, 1983	Tampa, FL	July 7, 1983
Frederickton, NB	Aug. 10, 1983	New York, NY	June 22, 1983	Toronto, ONT	June 22, 1983
Houston, TX	June 23, 1983		July 26, 1983	Washington, DC	June 15, 1983
Kansas City, MO	June 16, 1983	Omaha, NE	June 22, 1983	Wichita, KS	June 23, 1983
Lexington, KY	June 28, 1983	Ottawa, ONT	June 23, 1983		

Cullinet



## Calendar

### This Week

June 7-8, Farmington, Conn. — **Dump Reading (Includes CICS and DL/1 Dumps)**. Contact: Keith Lamb, New England Data Services, Suite 4, 1353 Boston Post Road, Madison, Conn. 06443.

June 7-8, Boston — **Microcomputers and Organizational Productivity**. Contact: Micro Conference, 215 First St., Cambridge, Mass. 02142.

June 7-9, Dallas — **Ada Launch '83, In-Depth Ada Language Technical Seminar**. Contact: Steven Goings, Suite 125, 1721 W. Plano Pkwy., Plano, Texas 75075.

June 7-9, San Francisco — **SAS Processing Course**. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

June 8-10, New York — **PC Expo: Show For Volume End Users of IBM Personal Computers and Compatibles**. Contact: H.A. Burno, Inc., 110 Charlotte Place, Englewood Cliffs, N.J. 07632.

June 8-10, San Francisco — **Planning for XA**. Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

June 8-10, San Francisco — **SAS Applied Time-Series Analysis and Forecasting Course**. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

June 9-10, San Francisco — **Data Facility Products**. Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

June 9-10, Cary, N.C. — **SAS Col-**

**or Graphics Course**. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

### Week of June 12

June 13-15, New York — **Audit and Control of CICS**. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

June 13-15, Boston — **DP Disaster Recovery Seminar**. Contact: EDP Security, 181 West St., Waltham, Mass. 02154.

June 13-15, New York — **Facilities for Auditing IBM's DOS/VS Operating Systems and Facilities for Auditing Within IBM's OS/VS Operating Systems**. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

June 13-16, Philadelphia — **CICS/VS Application System Design**. Contact: Rosa DiSanto, Compmed Technical Corp., 1133 Ave. of the Americas, New York, N.Y. 10036.

June 13-16, New York — **CICS/VS Testing and Debugging**. Contact: Rosa DiSanto, Compmed Technical Corp., 1133 Ave. of the Americas, New York, N.Y. 10036.

June 13-17, Lombard, Ill. — **Professional Systems Analyst Development**. Contact: Shirley Cerone, Cara Corp., 611 E. Butterfield Road, Lombard, Ill. 60148.

June 13-17, Oakbrook, Ill. — **Establishing Computer Configuration Capacity**. Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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June 17-19, San Francisco — **PC '83/West, Product Shows and Conferences for IBM Personal Computer.** Contact: Northeast Expositions, 826 Boylston St., Chestnut Hill, Mass. 02167.

### Week of June 19

June 19-22, Boston — **International Conference on Communication.** Contact: Dr. Leon J. Ricardi, M.I.T. Lincoln Laboratory, P.O. Box 73, Room D-422, Lexington, Mass. 02173.

June 19-22, Los Angeles — **EDP Auditors Association 11th Annual International Conference.** Contact: Larry C. Merich, Vendor Committee Chairman, EDP Auditors Association, P.O. Box 71684, Los Angeles, Calif. 90071.

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June 20-21, New York — **Enhancing SAS Technical Support Skills.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held June 20-24 in New York.

June 20-21, Chicago — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

June 20-22, New York — **Intracity Communications Networks.** Contact: Perspective, 15 Prospect St., Paramus, N.J. 07652.

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tact: Shirley McComber, IIT Research Institute, 10 W. 35th St., Chicago, Ill. 60616.

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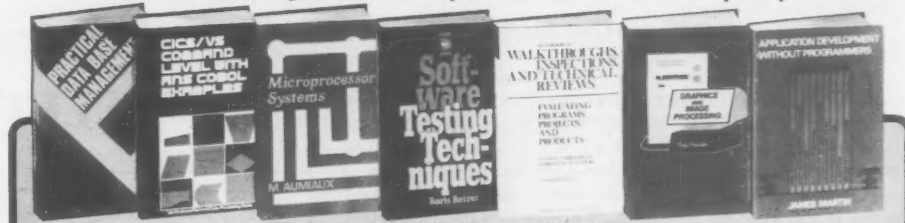
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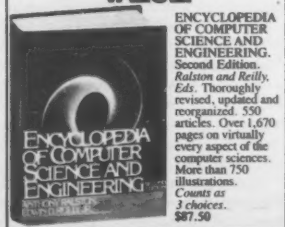
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## EDITORIAL

### Track Criminals, Not Workers

The U.S. Congress is threatening in its approaching adoption of a national worker identification system to measure the true depths of fuzzy thinking and reach a hitherto unknown nadir in judgment.

In order to curb the influx of illegal aliens who, it is said, are grabbing jobs and social benefits meant for U.S. citizens and legal immigrants, the Congress suggests building a huge, most likely automated, system containing the names and other pertinent information on all working Americans [CW, May 30].

Arrayed numerically through a supposedly fraudproof system of identification cards and numbers, the system could, its supporters say, keep track of legal workers and thus weed out the ineligible — all for a few hundreds of millions of dollars a year.

The idea is so full of flaws that enumerating them gets to be quite tedious, but a few examples will suffice.

First, experience shows there is no such thing as a fraudproof identification system. Congress itself has produced ample evidence of that.

Second, the system could become unbelievably expensive.

Third, Congress, in the full flush of confidence in computers, assumes the federal government could run such a system with an acceptable error rate. In fact, the Immigration and Naturalization Service has often been held up as the worst example of bureaucratic DP bungling.

Fourth, even in the unlikely event the system would actually perform as intended, the idea is a civil liberties nightmare. Why should all Americans have to register with the federal government in order to be granted the right to hold a job? Register criminals, not law-abiding citizens.

In addition, such a system, which would increase the record-retrieving capabilities of government agencies by several orders of magnitude, would undoubtedly be turned, sooner or later, to other bureaucratic purposes, such as collecting taxes, registering young men for the draft and collecting debts.

The temptation to use such a system for even more nefarious ends, particularly for surveillance, should not be dismissed out of hand. The Secret Service and the Federal Bureau of Investigation showed recently how willing they are to monitor surreptitiously the activities of those whom it subjectively disapproves.

All things considered, this is a bad idea. Congress should give it up immediately. No doubt, however, it will not. It must be recognized that 99% of all congressional decisions are political in nature; on the rare occasion Congress comes up with an idea it judges devoid of political overtones, it immediately adopts it, hailing it as an example of bipartisan leadership, no matter how bizarre or unworthy.

This, unfortunately, is such a case.



"What's the Matter With the Nonpolicy We Already Have?"

## LETTERS

### What Users Really Judged

I have just read the article about users' ratings of their mainframes, "Magnuson M80 Tops Datapro '83 Ratings" [CW, May 16].

While the Magnuson had the highest rating, this would hardly be the case if you removed the criteria pertaining to the operating system, compilers and assemblers, applications programs, ease of programming and ease of conversion. The Magnuson computers, as well as all plug-compatible computers, run operating systems and applications programs developed for IBM mainframes. The users are, in all of these cases, judging IBM software.

It is interesting to note that the IBM software was rated higher on the Magnuson computer than on any IBM or plug-compatible device. I would, however, not interpret this rating as an endorsement of IBM operating systems by this group.

Russell R. Suereth  
Director of Information Services  
Evans Products Co.  
Braintree, Mass.

### Free WP Training

Ouch! It hurts to read in the computer community's most influential weekly newspaper that a small Boston company must "rock the boat and be an inspiration to bigger companies like IBM" in the matter of free training in word processing skills.

The article "Trainer Offers Free WP Courses to Unemployed" [CW, March 28] creates the impression that only one small firm in Burlington, Mass., is offering free training in word processing skills to the economically disadvantaged in Massachusetts.

Such an impression is false. The Opportunities Industrialization Centers/IBM High Tech Training Center

that opened last September in Boston has been in business longer and has graduated more people than the course mentioned in the article. And we have placed 100% of our word processing graduates to date.

The article quoted Martin Robb of the Massachusetts Department of Manpower Development as saying that "this is the first offer of direct training from a private fund that I'm aware of."

I am surprised, in fact, that *Computerworld* did not catch Robb's error, since the Roxbury, Mass., training center has received a lot of attention in both the Boston area and national media, especially since President Reagan visited it earlier this year.

Howard H. Yenke  
Training Center Manager  
IBM  
Boston, Mass.

### The Criminal's Problem

I'm glad to see from the article "Crime in Chicago: Data Base Search Reveals Rampage of Chronic Shoplifters" [CW, May 16] that Chicago police are now able to identify quickly career shoplifters and serious offenders.

However, to what good will it be when the judicial system worries more about the criminal than it does about the victim, demanding early releases because of overcrowding in the jails?

Let's be honest with ourselves — with whose comfort should we be concerned, the criminal's or the victim's?

If overcrowding is a problem, let it be the criminal's problem, not the potential victim's. Jail isn't supposed to be fun.

Wayne C. Williams  
Training Coordinator  
Harris Trust and Savings Bank  
Chicago, Ill.

## DATA PAST

### Five Years Ago June 5, 1978

NEW YORK — The Association for Computing Machinery (ACM) asked Soviet President Leonid I. Brezhnev if an ACM observer could be allowed to attend computer scientist Anatole Sharansky's upcoming trial. Sharansky was accused of working as a spy for the U.S. Central Intelligence Agency.

### Ten Years Ago June 6, 1973

NEW YORK — Nearly 30,000 attendees and the return of IBM as an exhibitor in a national trade show were expected as the first National Computer Conference and Exposition opened its doors here. Two hundred-and-sixteen firms were expected to exhibit in 620 booths at the New York Coliseum.



SOFTLINE / Werner L. Frank†

# Getting Clear About Execution Environments

It is not uncommon to see a computer system advertised as multiuser and multitasking. In addition, such terms as "multiprocessing" or "multiprogramming" are often used to describe the applications execution environment. When all these attributes are joined by the options of background and foreground performance, with some buffered I/O operations and the spooling of print files, it is not surprising that the exact nature of the operating environment seems to need further explanation.

This array of terminology is suddenly coming back into focus as the microcomputer evolution moves to more sophisticated environments and as more complex operating systems emerge. An entirely new population of participants in the grand computer adventure are suddenly faced with terminology dating back several decades. The questions arise, "Is the terminology adequate?" and "Are words being used consistently and correctly?"

A framework within which to view and particularize the meanings of these words can be offered. This analytical structure is derived from the threefold approaches to data processing: first, from the perspective of the user; second, from the point of view of the programmer; and third, from the implications of the hardware itself.

## Single and Multiuser Systems

Systems are characterized as single user or multiuser. "Multiuser" means that many users can simultaneously share the computing resources, independently and at the same time. This denotation does not necessarily dictate the nature of the computer operating environment itself. Both single and multiuser systems may offer equally complex operating environments, since a

*'Systems are characterized as single user or multiuser. "Multiuser" means that many users can simultaneously share the computing resources, independently and at the same time. This denotation does not necessarily dictate the nature of the computer operating environment itself. Both single and multiuser systems may offer equally complex operating environments, since a number of applications programs or jobs can as easily be initiated by a single user as by a group.'*

number of applications programs or jobs can as easily be initiated by a single user as by a group.

Nevertheless, the circumstance of group use may necessitate a difference in design. This involves the degree of control required for memory and data file sharing by many parties who can inadvertently interfere with each other.

Such conflicts could, of course, occur for a single user as well. In this case, however, the individual is often expected to shoulder the obligation of managing control and integrity mechanisms.

## Internal Program Operations

This brings up the important issue of internal program operations of systems ranging in capability from simple, one-program-at-a-time execution to complex, simultaneous processing of a number of individual jobs. The former is often termed "serial program execution," while the latter is more accurately described as interleaved processing.

In simultaneous processing, two basic kinds of interleaving may occur. One, the interprogram, presumes the initiation and execution of more than one program at any one point in time, where "program" is defined to be a specific job, self-con-

tained and unrelated to the performance of the other programs.

Hence, the operating system facilitates the execution of these jobs in a completely independent manner, simply allocating computing resources to whichever such job requires them according to some established priority system. This process is known as multiprogramming and was the earliest form of improving the overall efficiency of computer processing.

By expeditiously taking advantage of the slower computer peripheral facilities, overlapping processing can be performed independently of and simultaneously with the higher speed computing facility of the CPU itself.

## Multiprogramming

Multiprogramming first was introduced when the I/O involved with file transfers from cards or magnetic tape took place while some other program was already in an intensive processing execution state. This mode of performance was given the name "buffering." The output printing process that takes place while a second program is executing is another example of specialized multiprogramming, called "spooling."

One might be tempted to call

time-sharing a multiprogramming process. This is not correct. Time-sharing is really the allocation of the available computing power of a machine among a number of users, according to some predetermined scheme and in conformity with a schedule of priority. This could well be accomplished without multiprogramming. However, most time-sharing systems would employ some multiprogramming capability in order to enhance the productivity of the overall process.

Recently, the term "concurrent" has crept into the vernacular with the announcement of the Concurrent CP/M operating system of Digital Research, Inc. This, however, is the type of processing already associated with the term "multiprogramming," which implies concurrent or simultaneous computing.

## Multitasking Approach

Now, let us consider the second form of interleaving processing, the intraprogram. This approach is called "multitasking" and refers to the simultaneous execution of a number of program modules, all of which have some affinity to each other.

"Multitasking" implies that there is a relationship between the tasks that are being simultaneously executed. In a sense, multitasking is much like multiprogramming except that the tasks are all part of a specific job and the steps in the execution sequence are related. That is to say, one task may depend upon the results of another task or may have to execute in a specified sequence, as it is related to other tasks.

Multitasking is, therefore, a much more complex and difficult facility than multiprogramming. It requires establishing appropriate synchroni-

(Continued on Page 34)

HUMAN CONNECTION / Jack Stone†

# Guidelines Needed for Breaking Into DP

How many serious-minded people who are looking for their first jobs or are thinking about changing careers to ones in DP have asked you such questions as, "What's the most effective way to get a job in your computer department? Should I attend programming courses at a community college? Should I buy a small home computer and do some self-training or maybe go to a computer camp?"

"Should I try to find a computer operations assignment, gain some experience and transfer into the programming department? Or is it better to get some quick word processing training and experience to qualify myself as an operations trainee? Also, I've had some experience as a supervisor; what's the best path for me relative to taking advantage of my leadership skills?"

And how often have you reluctantly and inadvertently shut off further discussion on the matter by answering with some such terse words

as: "After you have acquired three years of Cobol programming experience on our brand computer using our brand operating system, come into the office and I'll be happy to discuss the matter with you then."

Of course, the fact that most employers tend to, and in many respects are forced by business pressures to, hire specific experience and skills required rather than take on beginners and train from within makes it very tough for novices to crack this industry nut.

## Another Barrier

Now another barrier has evolved, more from the dynamics of the industry than from policy considerations within the centers: The requirements for entry-level folks sometimes change faster than those folks are able to complete their qualifications training.

Look at the collegians, for example, who try valiantly to anticipate a

career opening four years down the road. These days, they are really lucky if jobs consistent with their academic majors are abounding at graduation time.

Although I am a ruddy-faced optimist when it comes to the infinite opportunities in programming and analysis, I sometimes wonder how many more DPs the various industry segments can absorb, what with the enormous expansion of new software releases. Surely Atari Corp.'s recent troubles are suggestive of some slowing down of job opportunities in the consumer sector, although I suppose the military sector will pick up any slack.

## Buchwald's Picture

Art Buchwald captured the essence of the issue in his recent article "Pluck But No Luck." He relates the saga of one mythical Horatio Alger IV, who, after having been laid off from his firm for lack of any skills,

takes a six-month welding course and comes back to his company to seek a job on the production line. He is then informed that the welders have been replaced by robots.

Dauntlessly, Alger invests more time in robot maintenance training and checks back to discover that robot repairs are being handled by computers. After several more such iterations involving programmer training and a Ph.D. in economics, he finds out that the company has moved operations to South Korea, whereupon, Alger announces that he will now do as "any ambitious American boy would do. I'm going to retrain myself to be a South Korean."

I hope that neophytes in the real world don't have to face such travail. If you have some decent approaches to this problem I'd like to hear from you.

Letters to Stone can be addressed to him at Suite 207, 1377 K St. N.W., Washington, D.C. 20005.

# Defining Execution Environment Terms

(Continued from Page 33)  
zation procedures between tasks. The actualization of multitasking requires two basic functions that are exemplified in the Ada development environment.

The multitasking capacity of Ada is facilitated by language features allowing for task concurrency and task scheduling based on priorities and interrupts.

Sequencing of such related and interacting tasks is dictated by the rendezvous function. Tasks can either declare an entry point awaiting results from other tasks or declare an accept, indicating that they are ready to deal with an entry call. Working together, the accept and entry features cause the rendezvous.

## Conditional Logic

As can be seen, the multitasking process requires a multiprogramming capability, with an additional requirement that a conditional logic must apply to the precedence relationship of the tasks themselves.

The term "multitasking" is sometimes assigned to computer programs with a structure and organization that allow concurrent execution of that program by more than one task at a time.

A program with this feature is also often described as being either reusable or reenterable.

"Reusable" and "reenterable" refer to two different ways in which a program can be initiated and shared by different users, without having to restore the program individually or having separate execution copies for each such user.

It is preferable, however, to distinguish such computer programs from serial program execution, or single-thread programs, by referring to them as multithread programs. We restrict the term "multitasking" to the definition already offered above.

## Executing Environments

This brings us to the influence of the hardware on executing environments. The first important consideration is the availability of more than one CPU.

If a computer system includes more than one processing unit, then it is possible to introduce another concept, the notion of multiprocessing. The overall environment now can really get complex, as one imposes the programming facilities already described above.

It is, for example, possible simply to run two programs quite independently of each other in each of the available

processors of the system and consider this to be a multiprocessing facility.

One could also impose the multiprogramming or even the multitasking environment on more than one processor.

Whatever the case may be, one should be very clear about what is intended. Without any clarification, the term "multiprocessing" — or as it is sometimes

called, "parallel processing" — should be reserved for the following meaning: a system that executes jobs assigned by a master executive to more than one processor unit.

## Time-Sharing System

Another hardware-related operational environment is the time-sharing system already discussed. It was noted that time-sharing can simply

be a hardware usage issue, which typically invokes a time-slicing algorithm to further the interleaved usage of a single processor by many simultaneous users.

A special case of time-sharing is the popular execution mode often found in memory-partitioned systems, the so-called foreground/background operating environment.

This structure affords a

hardware manner of dividing up the computing resource and making it possible to have independent applications programs execute according to some controlled priority scheme.

How then should the hardware vendor describe the operating system environment associated with the computer offering?

Based on the above, it is  
(Continued on Page 35)



## DPers Can Adapt

I was a little confused by Jack Stone's series of articles titled, "DPers and the Psycho-Computer Syndrome." The series concentrated on my and Elizabeth Guarnieri's article, "The Psycho-Computer Syndrome," which appeared in *Computerworld Extra!*, Nov. 17, 1982.

Stone never contacted me or Elizabeth to discuss our findings. In addition, he seems confused about Sanford Weinberg's research on cyberphobia, and Stone has

arranged his rebuttal around the word "cyberphobia," not "psycho-computer syndrome."

Stone has defined "phobia" correctly from a psychological point of view. What he has not done is defined the context in which it has been used.

When Stone becomes better versed in what we are doing, superficial objections

will more than likely be eliminated.

Stone seems to assume that Elizabeth and I chucked traditional educational methods.

This is not the case. We use traditional lesson plans based on traditional educational methods and the psychology of learning.

Through experience, we value the human factors of

learning as much as methodology and certainly more than the equipment, the software and the surface of the learning situation.

As a former management information systems director, I strongly object to Stone's solid put-down of DPers' abilities to be people managers.

To be effective in the future, DPers must develop

people skills.

They can and are already beginning to become aware of their importance if only by reading Stone's description of their personalities.

In the evolutionary scheme, changes in the conditions of life bring about profitable variations.

DPers are people who are evolving to the managerial skills that are needed today. We are people who can adapt.

I think it is painfully obvious that psychology must overlay technology. If psychology does not overlay technology, we will be left with merely a smart/dumb hunk of iron.

In educational spheres, Stone has become an educational technologist and not the heuristic teacher he has painted himself to be.

Harold P. Guarnieri  
Automation  
Management, Inc.  
Richmond, Va.

## Defining Terminology

(Continued from Page 34)

suggested that confusion would be eliminated if such descriptions were to be limited to picking the applicable terms from each of the four following categories:

**Number of Simultaneous Users:** Single user and multiuser.

**Number of Processors:** Single processor and multiprocessor.

**Operating System Performance:** Serial programmed, multiprogramming and multitasking.

**Programming Execution:** Single thread, multithread and time-sharing.

Frank is an independent consultant and president of the Werner Frank Computer Group located in Calabasas, Calif.

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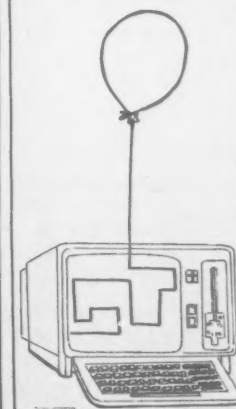
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Data for 1983

Product Code A100 - WIDGETS

			Region of U.S.			
			North Central	Northeast	South	West
Over 500000	Quantity	Total	17057	15045	13277	12603
	\$ Amount	Total	26757.94	24040.36	18853.55	16777.59
		Percent of Regional Sales	55.8	42.9	47.4	50.6
50000 to 500000	Quantity	Total	9012	13509	13280	11605
	\$ Amount	Total	13787.06	22071.22	20954.00	14210.25
		Percent of Regional Sales	28.7	39.4	52.6	43.0
Under 50000	Quantity	Total	4048	5131	None	1811
	\$ Amount	Total	7428.34	9944.05	None	2034.05
		Percent of Regional Sales	15.5	17.7	None	6.2

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## Oxford Offering Free Software To Its 'UFO' Users

HASBROUCK HEIGHTS, N.J. — Following what appears to be a recent trend toward software-related giveaways, Oxford Software Corp. has announced it will offer over \$5 million worth of free software to current and prospective users of its User Files On-Line (UFO) package.

Oxford's move is intended as an expression of thanks to its users in conjunction with the 1,500th installation of UFO, an IBM CICS application development system. The firm's president, Judd Shanker, said, "We simply want to recognize their contribution to our success in a material way that they can appreciate."

Squeeze, the software package being offered to current UFO customers and anyone who installs the product on trial through August, is a data compression routine utilized by CICS which is designed to reduce the amount of data sent to remote IBM 3270 devices. Developed by Oxford for in-house use to enhance response time on its terminals, Squeeze operates in IBM DOS and OS environments under CICS Release 1.4 and higher.

Although Squeeze is not commercial, (Continued on Page 40)

## Service Firm Tries Utility, Solves Downtime Problem

By Lois Paul  
CW Staff

MONTREAL — When customers of a service bureau here changed or deleted data sets following unsuccessful batch production runs at night, the bureau could not bring up its on-line IBM CICS environment the next day.

Since the unavailability of its system spelled a loss of dollars for L'Industrie Services Techniques, Inc. (IST), a year ago the firm began to look for a possible solution to the problem represented by the missing data sets. After considering the possibility of developing a dynamic data set allocation and deallocation utility in-

house, IST decided to go outside and became one of the first users of Software Technologies and Research, Inc.'s CICS Dynamic Allocation/Deallocation Subsystem (Dads).

"Since we are in the service bureau environment, our customers do their off-hour processing on their own time with their own schedules and procedures. We had to find a way to isolate ourselves from the vagaries of other people's processing and other people's errors," Jacques Desbiens, manager of IST's Data Base/Data Communications Software Group, explained.

(Continued on Page 40)

## Vsam Transparency Supported By ADR's CICS Service Facility

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced Release 2.2 of its ADR/Datacom/DB CICS Service Facility. The new release supports IBM Vsam transparency, provides problem-solving capabilities and supports IBM's SSX/VSE operating environment.

The release also allows the ADR/Datacom/DB (IBM) Vsam Transparency Fea-

ture to operate on-line with IBM's CICS/VS and allows applications written for Vsam to access the ADR data base without change, a spokesman said. The Service Facility allows multiple operations including translated Vsam calls and native ADR/Datacom/DB calls through the Service Facility.

Users can intercept and modify ADR/Datacom/DB requests before or after their execution and can restrict the interception by program, transaction identifier, return code and returned data.

Operator commands have been enhanced to include the current number of users per file table and the ADR/Datacom/DB return code on the last file, the number of start I/O operations performed by the CICS transaction, average I/O events per request and the status of the on-line Vsam Transparency Feature.

The Service Facility operates in IBM SSX/VSE, DOS/VS, DOS/VSE, OS/VS1 and OS/MVS operating environments and supports both CICS/VS command and macro-level programs. The permanent license fee is \$15,000 for OS, \$12,000 for DOS and \$9,000 for smaller environments. The permanent license price for ADR/Datacom/DB is \$73,000 for OS, \$59,600 for DOS and \$44,700 for smaller environments. ADR is located at CN-8, Route 206 & Orchard Road, Princeton, N.J. 08540.

## Page Migration Tool Introduced For Users of IBM's VM System

RIDGEFIELD, Conn. — Adesse Corp. has announced VM/SP Enhanced Page Migration (EPM) for users of IBM's VM operating system.

EPM provides improvements to page migration support within the VM/SP Control Program using advanced algorithms for page selection and processing, a spokesman said. EPM is said to be compatible with a number of storage devices, including the IBM 2305 Model 2; Intel Corp.'s 3805, 3815 or 3825; Memorex Corp.'s 3864; and Storage Technology Corp.'s 4305.

EPM makes more high-use pages available on the high-speed preferred system paging devices, reducing the time re-

quired to service paging I/O requests.

The product automatically adapts to the activity level of the system without need for user intervention, the spokesman said.

Disk paging I/O operations are performed less frequently, and migration of pages is based on individual page reference patterns. Migration is suspended when only high-use pages occupy the high-speed paging devices, and EPM treats high-speed paging as a fair-share resource on a dynamic basis.

The purchase price for EPM is \$9,000. The lease price is \$250/mo per CPU, including maintenance, from Adesse through P.O. Box 515, Ridgefield, Conn. 06877.



## CICS Users: Increase System Uptime

Look at the benefits when you install **DADS**, a Dynamic Allocation Deallocation Subsystem:

- Improve Mean Time to Recover
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**WATERFORD SOFTWARE ASSOCIATES  
251 HULL ROAD, WATERFORD, PA 16441****Runs Under DOS/VSE****Tool Offers Inventory Control**

ATLANTA — Leland Computer Services, Inc. has released the Receipt, Quality and Material Control System (RQMCS) for inventory and manufacturing control. The package runs on IBM 4341 or larger systems and plug-compatible computers running under IBM's DOS/VSE, OS or MVS operating systems.

System features include

on-line interactive editing and updating of receiving, materials requirements planning, inventory and purchasing data sets, fail-safe transaction processing and support of the IBM Communications-Oriented Production Information and Control System purchasing module.

The system contains three functional modules, three

update transactions and two local data sets, a spokesman said. Processing is menu-driven. Receiving module features include: power to return to stock or vendor, acceptance of unscheduled deliveries, issuance of dock to floor routing instructions and the ability to amend purchase orders.

The quality testing module features the ability to determine the status of any item in testing and to analyze historic failure rate patterns by item, distributor or manufacturer.

The on-line material control module provides actual counts of material placed into inventory whether front, back or both.

The package costs \$14,000, including 40 man-hours of installation and training. The company is located at Suite 146, 8601 Dunwoody Place, Atlanta, Ga. 30338.

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## System Handles ACH Inquiry

BROOKLYN, N.Y. — D.J. Soldano & Co., Inc. has announced an on-line inquiry and return item system for institutions sending and/or receiving payments through the Automated Clearing House (ACH).

The system runs under IBM CICS with any electronic funds transfer package, in-house software or ACH format without programming changes, according to a company spokesman.

Major features include: the capability to build a data base of originating and/or receiving transactions with flexible retention period; multiple inquiry keys; multiple screens with up to six items and 18 addenda records per screen; on-line selection, verification and proof controls for return item processing; generation of electronic returns to the ACH and electronic returns or report to corporate customers; processing of received electronic returns from ACH or originating financial institution and automatic updating of the data base; and security features, the spokesman said.

The package handles all pay types including check truncation and corporate trade payments with on-line browse capability for multiple addenda records, a spokesman said.

The package costs \$34,500 from D.J. Soldano & Co., located at 1622 Bay Ridge Ave., Brooklyn, N.Y. 11204.



## For DC-2 and Data Base Design Products

# TSI Offers Custom Dictionary Facility Option

NORWALK, Conn. — Unlimited data dictionary extensibility is available through TSI International's Custom Dictionary Facility (CDF), an option to TSI's Data Catalogue 2 (DC-2) and Facets Package's data base design

products on IBM and plug-compatible systems, as well as Honeywell, Inc. and Sperry Corp. computers.

The CDF option is said to enable users to access DC-2's standard entity/attribute set, as well as to create

and define their own unique ones. This option also provides users with an information retrieval system whereby they can scan for entries with specific contents; entries that share common characteristics; entries that use, are used by or relate to other entries; or specific detailed entries.

Security and management are controlled by a utility program which enables the data base administrator to impose security, provide backup and restore functions for dictionary integrity and provide space usage analysis reports, the vendor explained. Users also are now able to move automatically from a test dictionary to a production dictionary

and vice versa.

CDF is said to be data base and hardware independent. It is available to run under IBM OS using Vsam files and is currently being implemented in the Honeywell, Sperry and IBM DOS environments where DC-2 already operates.

An on-line option reportedly permits CDF to support IBM TSO and CMS operations with a new IBM CICS version in testing.

The CDF option to DC-2 is priced at \$10,000. An average package of DC-2 is available for between \$30,000 and \$40,000, the vendor said from 50 Washington St., Norwalk, Conn. 06854.

## Symbolics' 'MLCS' Linked To IBM's 4300, 30 Series

RICHARDSON, Texas — Symbolics Financial Systems, Inc. has announced the availability of its Mortgage Lending Control System (MLCS) on the IBM 4300 and 30 series hardware running under CICS.

MLCS, which to date has been available on the IBM Series/1 mini-computer, reportedly provides the mortgage banker, savings and loan, commercial bank or title company with a complete loan processing system incorporating loan origination, event tracking, policy auditing, document preparation, production reporting, marketing and commitment control support systems.

MLCS is delivered with a set of generation tools said to allow the user to mold MLCS to reflect the institution's unique requirements.

Using the tools, the user can expand, modify or create screens, subsystems, documents, reports and incorporate new lending programs entirely without DP intervention,

the vendor said.

Base price for the system is \$70,000; rental is available at \$2,500/mo, Symbolics said from 1740 N. Collins, Richardson, Texas 75081.

## Release 3.1.4 Of 'ACF2/MVS' Adds Security

LOS ALTOS HILLS, Calif. — The Cambridge Systems Group, Inc. has announced Release 3.1.4 of its Access Control Facility 2/MVS, said to provide security enhancements as well as simplified security administration for IBM and plug-compatible MVS-based systems.

Security enhancements include strengthened IBM CICS/Multiple Region Option support and last logon, the vendor claimed.

A user's last system access is recorded, thus allowing users to determine if their password has been compromised.

The software costs \$27,000 from the vendor at 24275 Elise, Los Altos Hills, Calif. 94022.

## Core & Code's 'BBL' Enhanced for DEC

WELLESLEY, Mass. — Core & Code, Inc. has released a new version of its financial modeling Basic Business Language (BBL) for use on any standard Digital Equipment Corp. Decsystem-10 or -20.

BBL II+ is said to feature extended variable names of unlimited length, extended file naming features, double precision arithmetic and added applications.

BBL II+ runs under DEC's Tops-10 or -20 and licenses for \$2,950 or \$195/mo, from 3 Winding River Circle, Wellesley, Mass. 02181.

## The ADABAS Seminar For DBMS Evaluators



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puter. You'll find out why our DBMS can be installed in a day while others can take months. You'll also learn how user-friendly a relational-like system can be. And you'll experience the benefits of using NATURAL, a productivity tool that can reduce application development time by up to 90%.

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**SOFTWARE AG**  
OF NORTH AMERICA, INC.

CW0806

# Firm Solves Downtime Problem With System

(Continued from Page 37)

Serving approximately 200 users in the Canadian provinces of Quebec and Ontario, IST provides time-sharing and computer services, as well as software development and consult-

ing. IST's Montreal-based headquarters houses its network of one Amdahl Corp. Model 5860 and two Amdahl 470V/8 mainframes, which are running under IBM's MVS operating system with CICS.

Dads was installed on four production CICS/VS regions at ITS in March for a 30-day testing/evaluation period. Based on a letter Desbiens sent to the vendor, the product passed with flying colors. "When Dads was made available on production CICS/VS regions, one copy of the users guide was given to the DB/DC support group. A short demonstration session was also presented at that time. The group, which consists mainly of master terminal operators, installed the Dads environment by themselves in three CICS/VS regions without any problems," he wrote.

A result of the installation of the software has been increased availability of the CICS environment.

"I couldn't quote a figure, but I

could say before its installation, we had at least two incidents per week of missing data sets and reduced availability because of that. Those incidents have been handled now; they have disappeared," he maintained.

ITS saved money by using the product because the company formerly had to absorb the costs of re-starts of CICS that were necessitated by missing data sets.

Several of the company's customers have noticed an improvement since the installation of Dads. "We have one customer in particular with a special requirement for allocating and deallocating data sets during the day. This customer has been pleased with the increased flexibility," Desbiens said.

## Oxford Offering Software For Free to Users of UFO

(Continued from Page 37)

cially available from the vendor, its value is estimated at \$3,000 per package, according to Oxford Software at 174 Boulevard, Hasbrouck Heights, N.J. 07604.

Oxford's announcement of the free software followed two similar offers last month. Tesseract Corp. announced that it would give free hardware to the first two purchasers of its turnkey systems.

This was intended to inaugurate Tesseract's OEM agreement with Formation, Inc., which manufactures a supermini. Customers purchasing one of Tesseract's turnkey systems will receive the hardware, operating system, on-line applications software and users manuals, along with installation, training and ongoing support, a spokesman for the vendor said through P.O. Box 7658, 101 Howard St., San Francisco, Calif. 94120.

"Software Sweepstakes '83" is a marketing approach that was unveiled by Software International Corp. of Andover, Mass., last month. It involved a drawing that enabled one user of an IBM System/34, a System/38 and a large-scale IBM or

plug-compatible mainframe to win a free perpetual license to use one of the vendor's financial software packages. The winners were drawn at the end of April, the vendor said from One Tech Drive, Andover Tech Center, Andover, Mass. 01810.

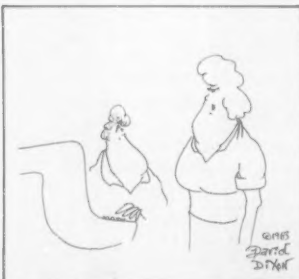
## 'Renum' Fits Fortran Compiler

NASHVILLE, Tenn. — Aranj Systems, Inc. has announced Renum, a renumbering and indentation program for Fortran compilers.

Designed principally for use on Digital Equipment Corp. PDP-11, VAX and Hewlett-Packard Co. HP 1000 Fortran compilers, the program can be adapted to operate on virtually any Fortran compiler, the vendor said.

The package reportedly increases productivity by structuring Fortran programs in a more readable fashion.

The package is available in both object and source code. The object code costs \$295 and the source code costs \$495, the vendor said from 2104 Sunset Place, Nashville, Tenn. 37212.



'See If It Will Compute Your Life Expectancy If You Don't Give Me the Checkbook!'

# It used to be frightening to outgrow a 4300.



Anyone who has ever outgrown IBM's 4300 Series knows about the bear-sized gap between the 4300's and the 3083. In performance and in price!

IPL's 4480 tames that bear — eliminates the IBM gap — and does a heck of a lot more besides. A continuous processing, program-compatible mainframe, the 4480 offers significantly more performance than the top-end 4300's, at only half the price of the next-in-line 3083.



## CA-Sort Incorporates VCM, Performance Upgrades

JERICHO, N.Y. — Computer Associates International, Inc. has announced Release 7.0 of its CA-Sort product, incorporating Virtual Cylinder Management (VCM) and other performance enhancements. The product runs on IBM DOS/VSE based systems.

VCM uses index pointers within the work file to reduce elapsed time and I/Os, a spokesman said.

The new release also includes Nrec and Skiprec options which allow any number of randomly selected records to be sorted, the vendor spokesman said. The product uses less disk work space by

utilizing an Inrec control statement to shorten the length of incoming records.

Users of the company's CA-Dynam product can place CA-Sort sort/merge keys in the CA-Dynam catalog under symbolic names and can initiate a sort/merge with a single control statement, the spokesman said. If the sort key must be changed, no job control or sort control changes are necessary; only a single change to the key record is needed.

The package costs \$3,000 for a three-year lease from 125 Jericho Tpk., Jericho, N.Y. 11753.

### For System/38

## 'MRC-Query' Series Bows

OAK BROOK, Ill. — Michaels, Ross and Cole, Ltd. (MRC) has announced the MRC-Query series, reportedly the first step toward a fully relational data base management system on the IBM System/38.

The series reportedly allows users to create and display on-line inquiries into the data base. The user selects fields and files via dynamically generated menus.

The current release consists of two modules — the MRC-Dictionary and the MRC-Retriever.

The MRC-Dictionary links the existing data base to the package, creating menus that list the fields and files on the data bases. It also documents the inquiries as well as the

System/38 data base.

The MRC-Retriever creates and displays on-line inquiries from the fields selected from menus and displays either single or multiple records accessed according to user-defined key fields, the vendor said.

MRC-Dictionary and MRC-Retriever cost \$1,140 each. For a limited time, both offerings, along with MRC-Grapher, a graphics module, will cost \$1,880 for all three, the vendor said. Free trial packets are available from MRC, Suite 501, 1301 W. 22nd St., Oak Brook, Ill. 60521.

## Modeling Tool Targets Users Of System/34, 38

ATLANTA — Datacomp Systems, Inc. has announced Version 2.0 of its Financial Modeling and Control System for the IBM System/34 and /38.

Under Version 2.0, an Interactive Spreadsheet Matrix Processor has been added to complement the existing Budgeting Cash Flow Simulation and Control programs. In creating a spreadsheet, users reportedly can select from two available matrix sizes. When entering calculation formulas, users can use the replicate feature to copy all formulas from one column or row to another.

The spreadsheet processor can be purchased as a subsystem or can be purchased separately for \$500 from Datacomp Systems.

The firm is located at Suite I, 2283 Dunwoody Crossing, Atlanta, Ga. 30338.

## Stock System Tracks Options

PALO ALTO, Calif. — A stock option software system said to manage and track all employee stock option plan information is now available from Ross Systems.

The Ross Stock Option System is based upon Ross' interactive Intac data base management system (DBMS) and is available either via Ross' worldwide time-sharing system or on a stand-alone basis running on Digital Equipment Corp. PDP-11 series minis under RSTS/E and VAX-11 systems under VMS.

The new accounting and tracking system reportedly meets all current legislative and federal requirements for incentive stock options and provides complete information for public, tax and internal reporting of stock option programs.

The interactive system provides a selection of standard reports, accommodates specific inquiries about participants and can interface with both company personnel and compensation systems.

The purchase price includes \$36,000 for the software, an average system price of \$24,000 for the required Intac DBMS and a \$2,500 installation fee, a spokeswoman said. Ross Systems is located at 1860 Embarcadero Road, Palo Alto, Calif. 94303.

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## Version II of 'First' Out for Series/1

SAN PEDRO, Calif. — Alphameric Software, Inc. has announced Version II of its File/Maintenance Inquiry Report/Writing Sorting Tools (First) package designed for IBM Series/1 systems.

First is a set of application building tools that reportedly can be used to maintain up to 999,999 records per file, write reports, select and sort records, produce business graphics, edit text and mass mail letters and labels.

Version II offers a work-sheet merge that has three-dimensional capabilities, the vendor said.

This multispreadsheet consolida-

tion can be set up to execute automatically. A menu buildup also is available within the spreadsheet, the vendor said.

First is licensed for use on each Series/1 CPU and all programs are dis-

tributed in object format accompanied by an operator's manual, the vendor said.

Version II costs \$2,000, from Alphameric, Suite 222, 330 S. Miraleste, San Pedro, Calif. 90732.

### *Fits Any Methodology*

## Estimating Tool Unveiled

LOMBARD, Ill. — Cara Corp. has announced a decision support-based estimating tool that reportedly can be tailored to fit any systems development methodology.

The Epsilon On-Line Estimating Management System is designed to define the components of a project, collect the estimated resource requirement for the components, compute the cost of each component based on user-defined unit costs and compare the estimates to standard resource requirements, according to the vendor.

Pricing starts at \$3,500, depending on the size and complexity of the installed methodology, according to the vendor.

Cara Corp. is located at 611 E. Butterfield Road, Lombard, Ill. 60148.

## Computer Sciences Adds Currency System to Infonet

EL SEGUNDO, Calif. — Computer Sciences Corp. has added a foreign currency management system to its Infonet remote computing service.

The system consists of a Forward Contracts System and an Anticipated Funds-Flow Exposure Model which uses a data base of foreign exchange rates and interest rates.

The Forward Contracts System tracks the user's outstanding foreign currency contracts and calculates premiums, discounts, gains and losses. It also enables the user to determine the desirability of a change in forward positions by comparing

positions held against forward rates.

The Anticipated Funds-Flow Exposure Model calculates a company's net exposure, currency by currency, based on its cash flow requirements over time. It also allows "what-if" scenarios with projected exchange rates to determine potential future exposure. Consolidation of exposures can be reported by account, product line, subsidiary, currency and country, the spokesman noted.

Costs are determined by resources used with no charge for installation from the vendor at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

## Pinnacle Offers Intro Course For MVS Users

SAN JOSE, Calif. — Pinnacle Computer Systems is offering a course for IBM MVS operators called "Introduction to MVS Systems Commands" that is available in the mini-course format.

The self-study course reportedly covers the 36 MVS system commands needed to monitor and control MVS. Students practice writing more than 100 command/operand combinations in preparation for actual console operations. The course contains over 400 questions that serve to reinforce the subject matter. Each mini-course is presented in an individual booklet.

The 15 minicourses were written by Michael A. Kechula, an educator in the operator training field. A set of five complete copies of the course is available for a one-time fee of \$500. Pinnacle Computer Systems can be reached through P.O. Box 7336, San Jose, Calif. 95150.

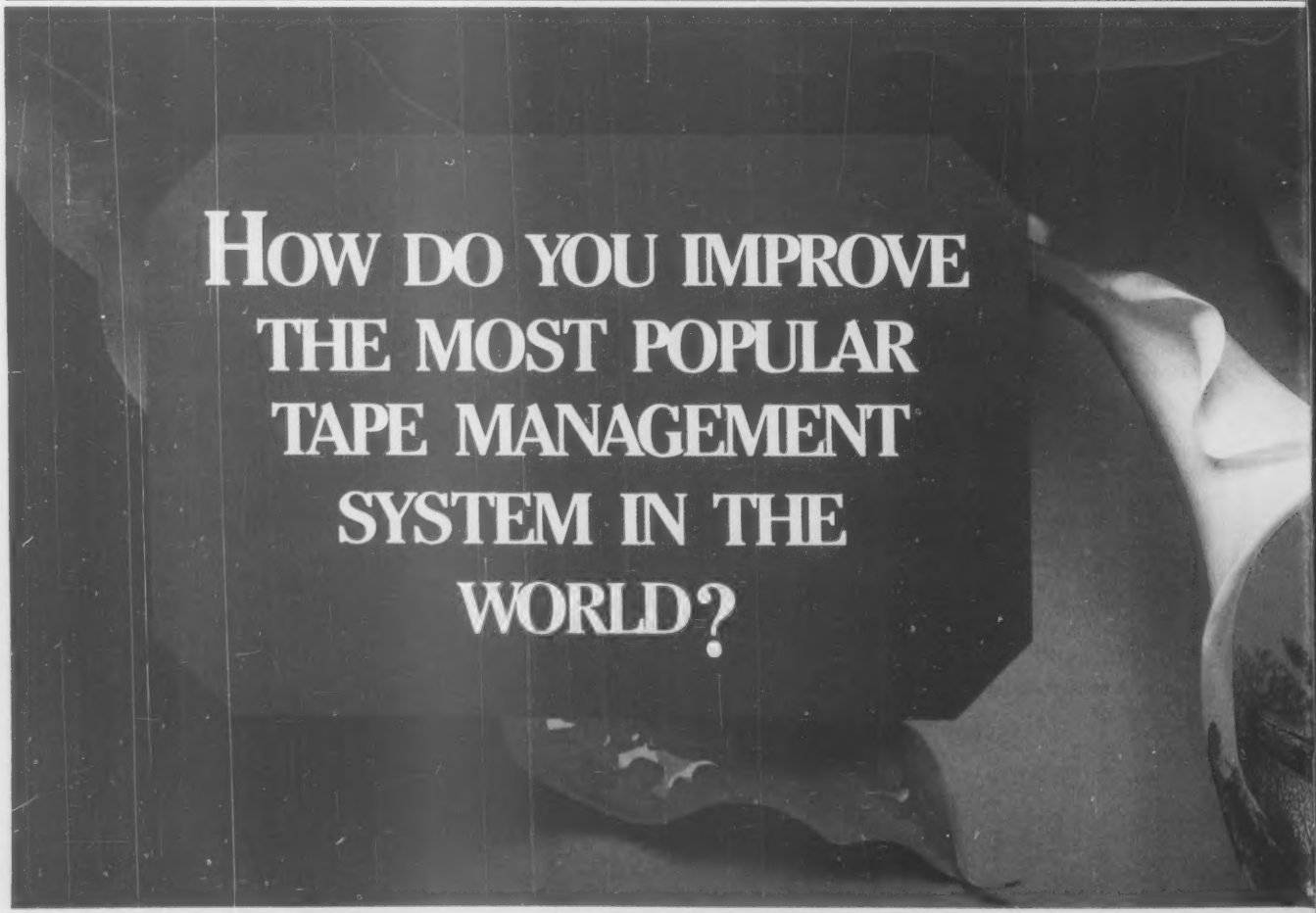
## Yourdon Announces Cobol Course

NEW YORK — Yourdon, Inc. has announced a three-week basic Cobol programming course.

Called Yoco, the intensive program is designed for employers who want to train employees with little or no Cobol experience. It is also designed to train programmers in the techniques of structured program-

ming. The course can be tailored to any computer installation.

Materials include copies of "Learning to Program in Structured Cobol," parts I and II, copies of visuals for support. It costs \$30,000 from Yourdon, located at 1133 Ave. of the Americas, New York, N.Y. 10036.



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## Micronotes

Peachtree Software, Inc. has announced the availability of its **Peachtext** word processing package for the IBM Personal Computer. The package features foreign language characters, multiple type fonts for printing, single-stroke commands and a default print file, a vendor spokesman said. The package is available for \$400 from the vendor at 8th Floor, 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

**Taps/PC Connection**, a hardware/software link from Informatics General Corp., is said to enable up to 128 IBM Personal Computer operators to communicate with each other. It costs \$25,000 for the initial link and \$750 for each IBM micro connected. Informatics is based at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Atom, Inc. has unveiled the **Atom Automated Telephone Office Management** system for use on Apple Computer, Inc.'s Apple III microcomputer. The software reportedly controls telephone usage by recording and storing detailed information on system activity. It is available for \$4,500 from the vendor at 25 Roxbury Road, Scarsdale, N.Y. 10583.

A spelling-checker software module has been made available by Beaman Porter, Inc. for use with its word processing software on the IBM Personal Computer. **Powerspell** costs \$125. The vendor has also updated its **Powertext** word processing software with the release of Version 1.9, priced at \$399, a spokesman said from Pleasant Ridge Road, Harrison, N.Y. 10528.

**Wordplan** is a text and data formatting package that reportedly enables users to manipulate text and numbers within documents. It runs under the Digital

Research, Inc. CP/M operating system and costs \$195. The vendor is DEA Software, which can be reached through P.O. Box 968, Fremont, Calif. 94537.

Multisoft's **Multi-Trieve**, is a data base management system for the Apple Computer, Inc. Apple II+ and Apple IIe systems. It costs \$199, the vendor said from 120 E. 90th St., New York, N.Y. 10028.

**Script 64** is a word processing package with a built-in dictionary for Commodore Business Machines, Inc. Commodore 64 microcomputer and is available for \$139.95. **C-64 Link** is an interface that lets Commodore users hook up various printers and disk drives, and it costs \$169.95. These products are available from Computer Marketing Services, Inc. at 300 W. Marlton Pike, Cherry Hill, N.J. 08002.

Personal Computer Products has released a product that reportedly allows the transfer of files from Apple Computer, Inc. Apple II, Apple II+ and Apple IIe to the IBM Personal Computer and IBM XT. The package sells for \$94.95, the vendor said from Suite C-18, 1400 Coleman Ave., Santa Clara, Calif. 95050.

Microrim, Inc. and Select Information Systems Corp. have jointly announced **Information Please**, a text-oriented program for the IBM Personal Computer, Digital Equipment Corp. microcomputers and other 16-bit microprocessors running Digital Research, Inc.'s CP/M or Microsoft, Inc.'s MS-DOS. Designed to simplify data base operations for the first-time user, the package prompts with English-like commands and includes an on-line tutorial and sample charts for use in organization. It is compatible with a variety of word processing programs, as

well as with VisiCorp's Visicalc. The package costs \$295 with information available from Microrim at 1750 112th Ave. N.E., Bellevue, Wash. 98004.

Micro Data Base Systems, Inc. has introduced **Knowledgeman**, an information management system designed to handle data management, ad hoc inquiries, statistical analysis, screen forms management, printed forms management, procedures and functions and spreadsheet analysis. For use on Intel Corp. 8086 and 8088 microprocessors under Digital Research, Inc.'s CP/M 86 operating system, **Knowledgeman** lists for \$500 from the vendor through Box 248, Lafayette, Ind. 47902.

EWDP Software, Inc. has introduced **Filebase**, a menu- and prompt-driven package designed to process files of records comprised of comma-delimited fields. The system runs on Zilog, Inc.'s Z80 microprocessor under Digital Research, Inc.'s CP/M operating system. The software is priced at \$75 from the vendor through Box 40283, Indianapolis, Ind. 46240.

Sage Computer Technology has announced the availability of Digital Research, Inc.'s CP/M operating system for its Sage II and Sage IV microcomputers. Sage computers start at \$3,600, including a P-System operating system. More information is available from Sage Computer Technology, Suite 4, 35 N. Edison Way, Reno, Nev. 89502.

Quanteckna Research Corp. has announced the release of **Quad-PC** for the IBM Personal Computer. Quad-PC is a relational data base management system for business and management applications. The list price for Quad-PC is \$695 from the vendor at 6902 220th South-

west, Mountlake Terrace, Wash. 98043.

Readiware Systems has announced **Readiwriter**, an IBM mainframe-compatible microprocessor document formatting system for the IBM Personal Computer. Readiwriter is said to provide user-level compatibility with IBM's document composition facility general markup language and script languages. Readiwriter requires an IBM Personal Computer with PC-DOS, 128K bytes of memory and two 160K-byte disk drives. It costs \$95 from the vendor through Box 680, W. Redding, Conn. 06896.

Supersoft, Inc. has released a Fortran compiler for use on 8086- or 8088-based microcomputers under Digital Research, Inc.'s CP/M 86, MS DOS and IBM Personal Computer DOS operating systems. Also available for Zilog, Inc.'s Z80, the **Supersoft Fortran** compiler sells for \$425 from the vendor at 1713 S. Neil St., Box 1628, Champaign, Ill. 61820.

**Busisoft Analyzer**, a ratio analysis program for the IBM Personal Computer, has been announced by Busisoft Corp. The program uses information entered from balance sheets and income statements for up to five periods. It includes a column for industry averages. The product costs \$199.50 from 6140 Horseshoe Bar Road, Loomis, Calif. 95650.

MAI/Basic Four Business Products Corp. has announced the availability of Micropro International Corp.'s **Wordstar**, **Spellstar** and **Mailmerge** word processing software on the **Basic Four S/10** microcomputer. Wordstar costs \$495, Mailmerge costs \$150 and Spellstar costs \$250 for the S/10, which begins at \$3,995 with a single 650K-byte diskette drive from MAI/Basic Four at 601 San Pedro N.E., Albuquerque, N.M. 87108.

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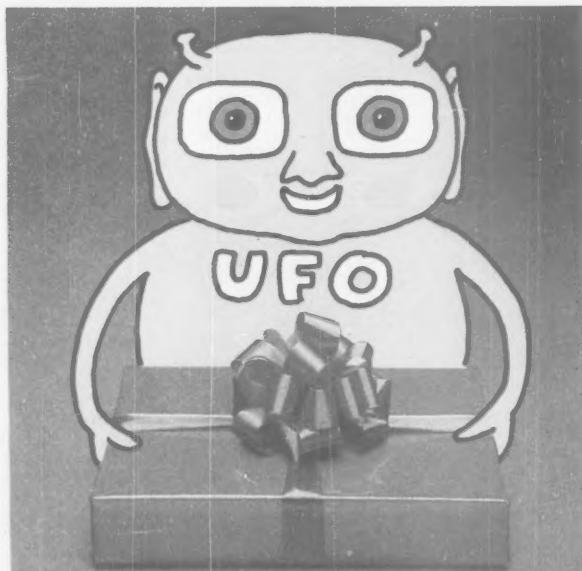
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## But U.S. May Intervene: Ex-FCC Head Two-Way Transmission Seen In Wings

By Phil Hirsch

CW Washington Bureau  
WASHINGTON, D.C. — U.S. CATV network operators are ready, willing and able to provide business users with two-way data channels that bypass the local telephone network, and digital electronic message services vendors are planning to add point-to-point transmission, according to speakers at a recent communications conference held here.

But the U.S. government may block the path of cable operators and other specialized carriers in this endeavor, a former Federal Communications Commission (FCC) chairman said.

The cost of providing two-way service to business users is "modest," Elizabeth H. Olenbush, business development manager of Warner Amex Cable Communications Corp., said. She knows of "at least three" companies presently marketing return amplifiers and predicted

that "by the end of this year, about half of the installed and planned cable TV plants in this country will have two-way transmission capability."

Beginning next year, cable TV operators, in collaboration

with outside investors, will begin building two-way systems for business customers, according to Jerome D. Lucas, president of Telestrategies, Inc. Local telephone companies are among the possible partners in

this venture. Michigan Bell, Illinois Bell, Chesapeake & Potomac Telephone Co. and others have already made moves in this direction, Lucas said.

But former FCC Chairman Richard E. Wiley told the conferees that bypass vendors face opposition from Congress, state and federal regulators.

Wiley, now a private attorney, said the FCC's recent access charge decision will reduce costs for AT&T while increasing them for specialized carriers. Result: The telephone company should have little trouble retaining its dominant position in the intercity communications market.

On the local level, higher  
(Continued on Page 48)

## Bypass Vendor Profits Seen Mushrooming

By Phil Hirsch

CW Washington Bureau  
WASHINGTON, D.C. — Revenues earned by vendors of point-to-point local bypass services will grow fourteen-fold between 1982 and 1988 — from \$50 million to \$700 million, according to Jerome D. Lucas, president of Telestrategies, Inc. But AT&T's Dataphone Digital Service (DDS) revenues will increase from \$300 million to \$1.4 bil-

lion during the same period.

Digital electronic message services (Dems), cable TV and private microwave systems will account for the bulk of the bypass growth, Lucas said.

Many larger companies are building private microwave facilities to evade increases anticipated in their local telephone rates because of AT&T's divestiture and  
(Continued on Page 48)

## Processor Emulates IBM Controllers

MIAMI — Innovative Electronics, Inc. has announced the MC-80/602 communications processor. The product is said to emulate the IBM 3271 Models 1 and 2, IBM 3274-51C and IBM 3276 Models 1 and 2 communications controllers. It converts a general keyboard send/receive (KSR) device or an asynchronous ASCII host into a full-function IBM 3277-1, 3277-2, 3278-1 or 3278-2 terminal communicating with the IBM host using Ebcidic Binary Synchronous Communications protocol, the vendor said.

Asynchronous ASCII KSR terminals can be used in both local and dial-up applications, a spokesman said. Full screen mapping is performed by the MC-80/602.

Data displayed on the KSR terminal is the same as an IBM 3277/3278 display station with virtual screen sizes of 480, 960 and 1,920 char. All screen formatting capabilities are supported, including protected and unprotected alphanumeric, numeric and nondisplay fields

and autotabbing, the spokesman noted.

The processor provides up to 16K bytes of read-only memory or random-access memory and one serial communications port. The price is \$1,650 from 4714 N.W. 165th St., Miami, Fla. 33014.

## Voice Terminal Unveiled

BEDFORD, Mass. — Verbex, a division of Exxon Enterprises, has introduced a continuous speech voice data entry terminal designed for use in material management, quality control, computer-aided education and computer-aided design and manufacturing.

The Verbex 3000 terminal is said to add voice data entry ca-

pability to computer systems. The terminal consists of a user workstation and a speech processing unit. The workstation includes a close-talking directional microphone headset through which the user inputs data or commands verbally.

The terminal is available for \$18,000 from Verbex, Two Oak Park, Bedford, Mass. 01730.

IRVINE, Calif. — AST Research, Inc. has announced four communications-oriented products for IBM's Personal Computer and Personal Computer XT microcomputers.

Developed by Orchid Technology, Inc., PCnet is an integrated hardware and software local-area network product. The local-area network was designed specifically for the IBM Personal Computer and Micro-soft, Inc.'s MS-DOS operating system, the vendor said.

PCnet is based on a standard 75-ohm CATV coaxial cable that allows devices to operate up to 7,000 feet away from the processor. PCnet is a carrier-sense multiple access with collision detect (CSMA/CD) network and transmits data at a rate of 1M bit/sec. The local-area network can also support a variety of hard disks and computer sys-  
(Continued on Page 52)

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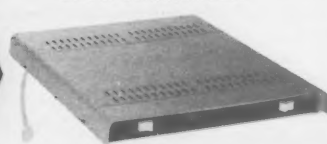
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## For 3270 Networks

# Davox Unveils Terminals

MERRIMACK, N.H. — Davox Communications Corp. (formerly Datavox Communications Corp.) has introduced three series of data terminals said to feature IBM 3270 networking, personal computing with an IBM Personal Computer, asynchronous terminal operations and voice communications in a single desktop device.

The Series 811 Multi-Mode intelligent terminal is said to offer Ascii/TTY communications and Digital Equipment Corp. VT52 terminal emulation. It also offers 3270 compatibility for use with IBM mainframes. The 811 will be available in August for \$12,855 for a five-display cluster.

The Series 911 Maxi-Mode intelli-

gent terminal adds IBM Personal Computer attachability and DEC VT100 emulation to the 3270 and synchronous ability of the 811. With the 911, an IBM Personal Computer can be attached either to a specific terminal for dedicated use or to a cluster controller for selected users in the cluster to share the Personal Computer.

As an authorized value-added dealer of IBM Personal Computers, Davox has designed the terminal to use off-the-shelf software for the Personal Computer, a vendor spokesman said. Available in August, the 911 will cost \$13,355 for a five-display cluster.

The Series 921 Professional PC Deskset combines integrated voice and Multi-Mode data communications with IBM Personal Computer attachability. Users can attach a Personal Computer either directly to an individual Deskset, creating a dedicated personal computer for that workstation, or to the cluster controller, which allows multiple designated users within the cluster to access and share an IBM micro.

The 921 built-in telephone offers such telephone capabilities as automatic dialing from a personal directory or from the host data base. This feature is said to be particularly useful in telemarketing applications, a vendor spokesman said. The 921 is available immediately at \$17,569 for a typical five-station cluster, including a shared IBM Personal Computer.

Features included on all the terminals are a 12-in. display monitor in green or amber phosphor with a 1,920-char. screen. Also featured are Davox's Super Buttons, which allow users to perform multifunction tasks with one keystroke, according to a vendor spokesman.

More information on these products can be obtained by contacting Davox at 6 Continental Blvd., P.O. Box 328, Merrimack, N.H. 03054.

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## Tab Announces Smart Terminal

PALO ALTO, Calif. — Tab Products Co. has announced a smart terminal for use in an environment of Honeywell, Inc. computers. The terminal features a 15-in. screen that can reportedly format 80 or 132 columns wide, has three operational modes and is said to provide asynchronous and synchronous communications.

The Model 132/15H terminal can be keyboard-selected at speeds from 110 to 19.2K bit/sec. It has an internal clock and up to 14 keys devoted to user-programmable functions, the vendor said.

The terminal features standard 95 Ascii keys, a 14-key numeric pad and 26 control keys, as well as the ability for users to program up to 14 control keys, according to a vendor spokesman.

The terminal is priced at \$2,200. More information is available from the vendor at 1451 California Ave., Palo Alto, Calif. 94304.

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# Local Bypass Service Revenues to Grow: Exec

(Continued from Page 45) the Federal Communications Commission's (FCC) recent access charge decision. The systems used by "at least 10 major corporations will have more capacity than they need," Lucas added, because the companies intend to become resale carriers.

Many of the new private microwave systems operate in the 18 GHz band, where plenty of unused frequencies are available and the signal can be transmitted up to 10 miles without use of repeaters. Equipment is currently available from "several ven-

dors," Lucas said. There is "growing interest" in 24 GHz microwave.

Dems are essentially central transceivers communicating with subscriber rooftop antennas using three 1.5M bit/sec microwave channels, each serving a surrounding area circumscribed by a 120 degree arc. Although Dems, as defined by the FCC, are based largely on the use of point-to-multipoint "digital termination systems (DTS)," two of the companies authorized to offer Dems are planning to add point-to-point capability:

- Tymshare, Inc. will employ a scheme that reuses each of six frequencies eight times; the result is 48 dedicated, point-to-point channels, each able to transmit at 800K bit/sec., according to Lloyd Nirenberg, Tymshare's manager of radio and satellite systems.

- Contemporary Digital Services, Inc. (CDSI) is exploring the use of several frequencies — among them being Multipoint Distribution Service (MDS) channels, according to Don Silverman, CDSI's executive vice-president.

MDS is a specialized common carrier service, operational in all of the nation's larger cities. Mainly, MDS channels carry pay TV programs. Typically, they link the head end of a local cable TV network with the nearby node of a long-haul satellite or terrestrial network that delivers the program from a

remote studio. Silverman's company, CDSI, is a subsidiary of Contemporary Communications Corp., the nation's second-largest MDS carrier.

Adding point-to-point

transmission to DTS networks will accommodate more users and a greater variety of applications, the speakers indicated. And start-up costs will be greatly reduced.

## Cable Operators Seen Ready To Provide Bypass Service

(Continued from Page 45) rates will encourage bypass — particularly by larger companies. But Congress and state and/or federal regulators are likely to impose restrictions aimed at helping local telephone companies hold on to their business customers and thereby reduce higher local rates, Wiley said.

Walter Ciciora, vice-president for research and development at American Television and Cable Communications Corp., the nation's

largest cable TV network operator, said at a recent conference in New York that it will be several years before two-way cable TV transmission becomes widely available [CW, May 9].

Ciciora was talking primarily about service to residential rather than business users. Because virtually no system operator can afford to invest in this equipment, no one is marketing the return amplifiers needed to implement two-way cable TV service.

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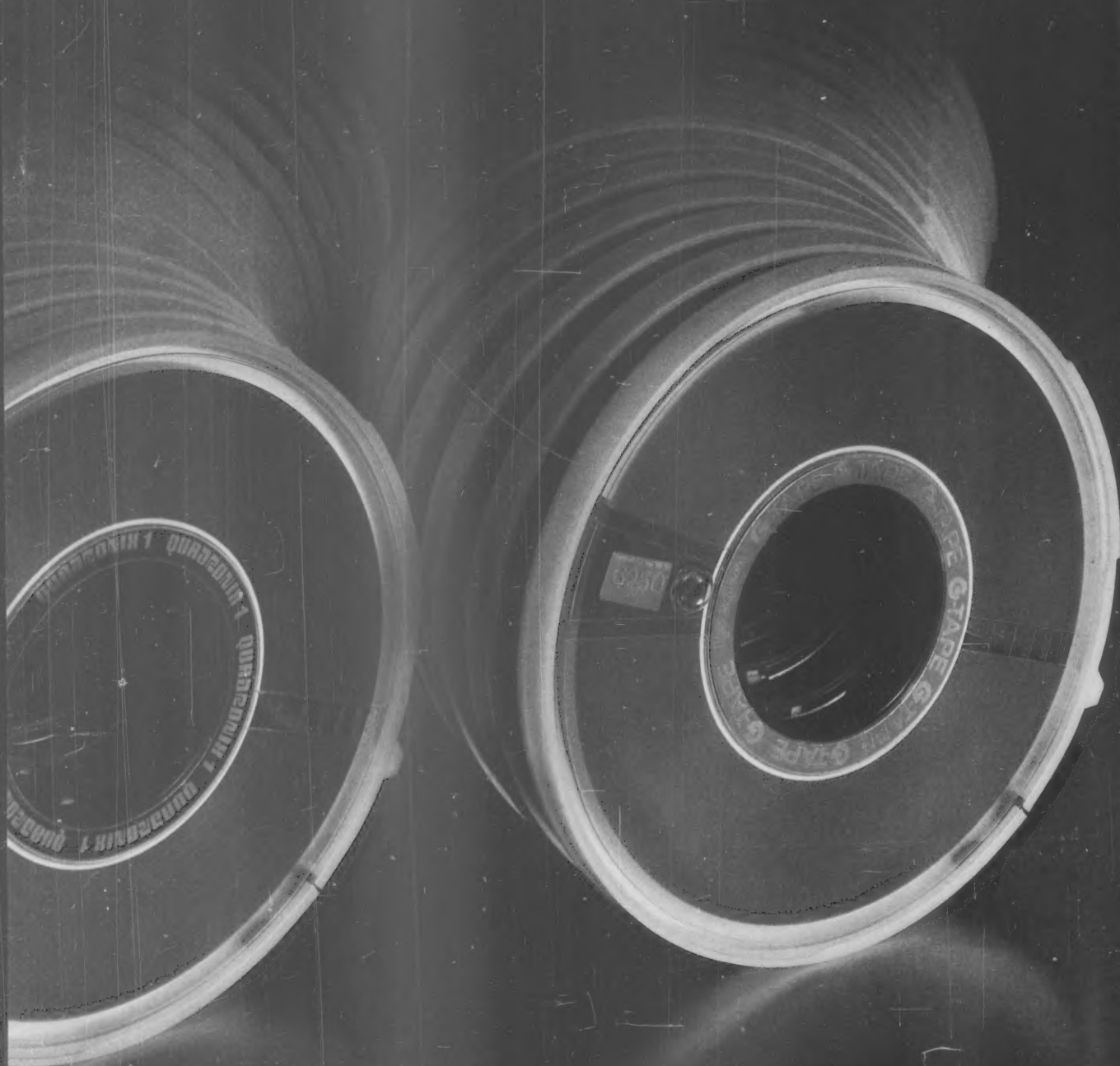
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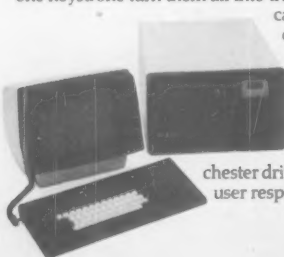
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### Also Function as Modems

## Interface Converters Debut

WOODBURY, N.Y. — Remark Datacom, Inc. has announced a series of RS-232-to-RS-422 converters configured to appear to the RS-232 interface as data terminal equipment and data communications equipment.

In addition to interface conversion, Models 63-3S and 63-4S perform the function of a pair of high-speed, short-haul modems, according to a vendor spokesman.

Each model is self-powered via a wall-mounted transformer and internal regulation circuitry, the vendor said.

As short-haul modems, the series 63 is designed to transmit and receive full-duplex data at 100K bit/sec up to 4,000 feet over two twisted

pairs, a vendor spokesman said.

Each device also supports an additional three signals in each direction, provided the user supplies a twisted pair for each signal, the spokesman maintained.

The Models 63-3S and 63-4S are priced at \$126 for single quantities. More information is available from the vendor at 4 Sycamore Drive, Woodbury, N.Y. 11797.

## IBM Micro Users Get Four Units

(Continued from Page 45)

tems and has an adapter designed to fit into a single IBM Personal Computer I/O slot, the vendor said.

PCnet includes a disk sharing feature that allows the Personal Computer to share hard disk drives and printers installed on other Personal Computers. A file-locking feature allows single-user applications to be converted to multiuser applications, the vendor said.

Prerequisites for PCnet are an IBM Personal Computer with 64K bytes of main memory, a monochrome or graphics display, a floppy disk adapter and one disk drive. PCnet costs \$695, the AST said.

In addition, AST announced AST-BSC, a communications package for Binary Synchronous Communications IBM 3270 emulation.

The AST-BSC package provides all the facilities of an IBM 3270 or 2770 terminal. Added features include the ability to operate the IBM Personal Computer as an IBM 3274 Model 51C control unit, an IBM 3278 Model 2 display station, an IBM 3279 color display station or an IBM 3287 printer. Optional features include emulation of an IBM 2770 batch remote job entry terminal and a cluster controller with support for additional IBM Personal Computers or Ascii terminals. The AST-BSC feature costs \$895, the vendor said.

Also announced was the Plusmodem, a modem card for the IBM Personal Computer or Personal Computer XT.

It consists of an integral Bell 212A-compatible, 1,200 bit/sec direct-connect modem that is designed to offer autodial/autoanswer modes and can automatically select transmission rates. In addition, the Plusmodem has provisions for an IBM-compatible game port.

The Plusmodem costs from \$595 including a direct modem, clock and game port. A fully configured modem costs \$695, the vendor said.

AST also announced the AST-5251, a hardware and software product that allows the IBM Personal Computer to emulate an IBM 5251 terminal. It was designed to run under the MS-DOS operating system and features a processor with at least 64K bytes of main memory, a diskette adapter, one diskette drive, a monochrome or color/graphics adapter, an 80 by 25 character display, a parallel printer adapter and an IBM-compatible printer. The AST-5251 costs \$895.

More information is available from the vendor at 2372 Morse Ave., Irvine, Calif. 92714.

## Combination of Fine Tuning and Vision Specialists Detail Successful Networking Plan

By Katherine Hafner

CW Staff

ANAHEIM, Calif. — Planning for network services requires a combination of fine tuning to user needs, a good idea of what is available and 20/20 vision into the future.

Such was the belief of participants in the recent National Computer Conference session on network services planning, which brought together communications specialists from AT&T and DMW Group, Inc.

"We've seen networks grow from

simple to highly structured architectures," John King of DMW Group in Carmel, Calif., noted. "Variation in networks is growing at tremendous rates. Voice, data and text are coming together so rapidly we can't stay away from it."

Planning for network services, or network modeling, King said, depends on the particulars and needs of the network involved. At best, network planning is a black art, he noted, adding, "Networking is more than providing a hunk of cable; it is encompassing an entire range of capabilities." The nature of networks is changing so quickly that "whatever we say today will be highly modified

tomorrow. Even users, for example, are seeing a need for huge amounts of bandwidth," King noted.

Technology controls our planning, according to panelist Bob Lawrence of AT&T. Today, 50% of metropolitan areas have digital capability, which will increase about 40% by 1990. Lawrence predicted that in many places, fiber will replace copper and that AT&T customers will ask for ever wider bandwidths.

But AT&T is limited by regulations imposed by next year's divestiture and the creation of subsidiary operations, which hampers communications among divisions of the company, Lawrence said.

## Graphics Processor Released For IBM SNA/SDLC Users

SANTA CLARA, Calif. — Versatec, a division of Xerox Corp., has introduced a graphics network processor that sends and receives Ebcidic or binary data in IBM Systems Network Architecture (SNA) networks using IBM's Synchronous Data Link Control (SDLC) protocol.

Operating as an IBM 377X remote job entry station, the processor features operator console support, duplicate character compression and SNA standard interleaved communications that allow simultaneous operation of multiple logical devices.

Under the SDLC protocol, communications with the host via synchronous modems or direct connection to an IBM 3705/6 communications controller permit transmission of large data blocks to electrostatic plotters over satellite or

land lines, a vendor spokesman said.

The price of the processor is \$8,500 from the vendor at 2710 Walsh Ave., Santa Clara, Calif. 95051.

## Datavox Unveils Deskset Unit

MERRIMACK, N.H. — Datavox Communications Corp. has announced an Ansii 3.64- and IBM 3270-compatible multifunction deskset said to provide single-button access to most computer systems.

Designed for use by executives, professionals and other knowledge workers, the Extended Multifunction Deskset also features an integrated intelligent telephone. The unit also functions as a dial-up Ascii/teletype-writer terminal for access to outside time-sharing, electronic mail and information services.

In addition to allowing users to dial telephone numbers automatically from a personal phone directory of up to 85 entries, the Deskset reportedly can automatically dial from a host computer data base.

The unit costs \$2,180 from the firm located at 6 Continental Blvd., P.O. Box 328, Merrimack, N.H. 03054.

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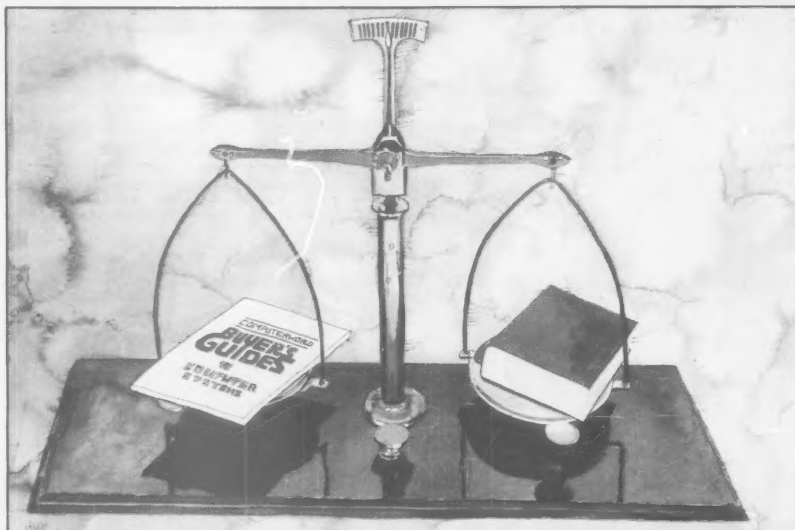
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ADVERTISING PAGES 55 THROUGH 60 ARE MISSING.



# The Present And Possible Future **DATA BASE MACHINES**

By Vincent C. Rauzino

The figurative divorce between programs and data, now entering its final stages, is both inevitable and desirable. This split began many years ago when data was wooed away from programs into independent files with names like SAM, Isam and Vsam. The breaking away accelerated when data base management systems (DBMS) gave data even more independence by providing separate maintenance software.

Most advantages of separate filing and maintenance are obvious and welcome: the same data can be shared by many programs; the data management overhead cost is more or less predictable and can also be shared among many programs; the data can be filed away in presorted/premerged strings to simplify certain kinds of retrieval operations.

Other advantages are less obvious but potentially far more important to the future of information processing. These advantages grow from an emerging ability to handle data as groups of totally independent quasi-mathematical entities, which can be combined to yield abstract associations, correlations and even extrapolations.

These newer capabilities will not replace the

## IN DEPTH

## IN DEPTH

classic "payroll program needs payroll data," bread-and-butter operations at most computer centers. Instead, they can extend operations to allow the payroll data to be combined with in-

ventory or sales data, for instance, in such a way that the combinations can be queried for abstract associations, such as, "How many Scorpios worked on widget production in 1976?" Don't be

fooled by the triviality of the example — the capability is definitely nontrivial.

### Data Models

"Quasi-mathematical entities" are called relations. Re-

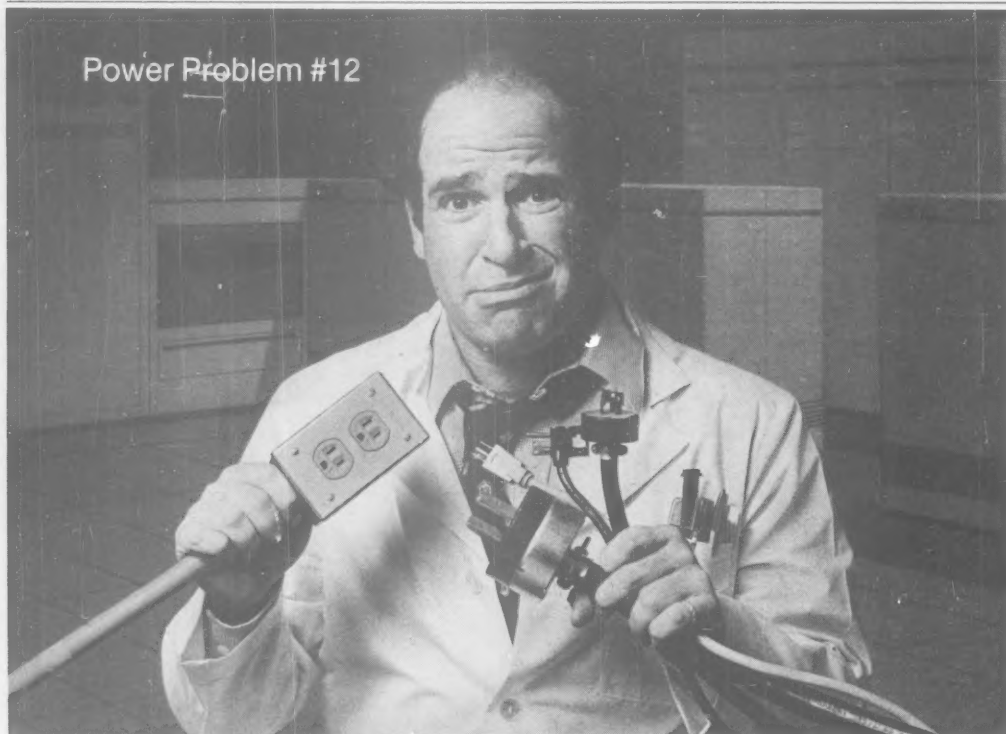
lations comprise the newest data model. Older hierarchical and network data models are incompletely separated from their related programs because the data is linked internally by pointers into

structures called schema and subschema, and these schema/subschema patterns are wholly governed by the requirements of the using programs. Hierarchical and network models cannot respond easily to free-form queries. Conversely, they provide excellent support for standard production applications (payroll, inventory and so on) because each program is literally pulled through the data file along a predictable schema/subschema path.

Another older model, sometimes called "inverted-list," uses neither pointers nor relations. It consists of randomly distributed records surmounted by a hierarchy of indexes. Organizational views of the file are controlled entirely through the indexes. Inverted-list models are somewhat easier to query than the hierarchical and network models, but the net effect is that the program-driven schema/subschema structures are simply transferred out of the files and into the indexes.

The relational model organizes data into tables of like data and supports intertable linkages through common data occurrences rather than pointers. The tables (relations) are then normalized to create a file in which each table is uniquely identified to the system (basically, no relation is defined in terms of another relation). The contents of the relations are, of course, predicted by the applications universe (information about California wines, for example, is not included if none of the applications needs it), but no other relationship exists between the programs and the data model.

This extraordinary degree of program-data independence reduces program-data communications to a simple interface that can handle with equal facility specific



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demands such as, "Payroll program A needs payroll data W" or general queries such as, "How many Scorpions worked on the widget project?"

The ability to build and maintain an independent data model implies that all the DBMS-related software can be safely moved to the DBMS side of the interface. The entire DBMS with its related disk files could then be treated by the host operating system in the same way as any other peripheral attached to the system, needing only some coordinating signals and a linguistic interface that can accommodate all of the host's needs.

Continuing one step further, why not give the DBMS its own special-purpose computer? Then the general-purpose host could be completely relieved of all data-specific operations and the DBMS computer could be optimized for data-related operations. Several vendors have answered the question with data base machines that promise to become truly independent "data computers" eventually attachable to any host as a simple peripheral device.

#### Some Negatives

Data base machines have the potential to overwhelm all competition from software DBMS. Why, then, haven't they taken over the computer world? There are several good and logical reasons of the kind that always surface in the gap between technological elegance and bottom-line practicality.

All of the currently available data base machines are based on the relational model, which appears to be the only model suitable at present for data-independent operations. Two major complaints leveled against the relational model are that it tends to be slow and not an easy model to use for developing large-scale applications. And then there is the really massive task of converting data in a pointer-based model to the relational model. Data base machines do not yet quite offer enough advantages to convince the IMS, DL/I, Total, IDMS and other DBMS users that the time and expense of conversion are worth it all. The data base machine option is thus meaningful only to the first-time DBMS user to whom all options are still open.

Another potential problem is that the utility-like separation of data management from the mainstream of DP operations may cause a real split between DP and data managers and thus encourage contention instead of cooperative independence. Unfortunately, no technology yet discovered can solve these kinds of people problems.

#### Basic Types

There are basically two ways to build a data base machine. One way is to start with an existing DBMS and simply offload chunks of its software to a subordinate computer. This "ex-

**'Why haven't data base machines taken over the computer world? There are several good and logical reasons of the kind that always surface in the gap between technological elegance and bottom-line practicality.'**

tracted-function" approach was applied most notably by Software AG to Adabas.

The second way is to build a new DBMS around dedicated modules of computer power designed solely to

solve data management problems.

The first commercially available implementation of a "dedicated-function" data base machine was the IDM 500, introduced by Britton-Lee, Inc. in 1980. The data base machine survey that appears later in this article offers short analyses of six currently available dedicated-function machines.

The inherent advantages of data base machines are gradually coming into focus. Their major advantage is,

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# DATA BASE MACHINES

In Depth/4

## IN DEPTH

of course, the ability to off-load practically all of the data management function from a host. The host is relieved of three burdens: the need to build and maintain large data files on disk, the

need to allot some portion of memory to DBMS software and the need to assign some portion of CPU time to execute the simpleminded compare/sort/merge operations that constitute the majority

of the data retrieval chore.

A less obvious but just as potent advantage derives from the nature of the data base machine interface relative to an independent data model. The interface can be

designed with high levels of intelligence to enable it to accept any language from any host and to convert it into a standard internal form. All of the data base machines' internal operations

are thus completely consistent regardless of the hosts' differences, and the only necessary accommodations are to variations in protocol and format.

The data base machine can thus become a true general-purpose utility (in the sense of a telephone or power plug) that can handle "n" processors simultaneously and incidentally provide a common node for limited communications among different processors. Multiple data base machines can also be connected to a single processor to separate and isolate different data bases that may require unique handling techniques.

All of the data base machines discussed in this article are based on the relational data model, primarily

### "Hyatt was a pioneer of local area networks. When Datapoint introduced the first one, we ordered."

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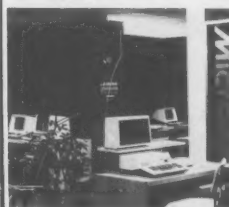
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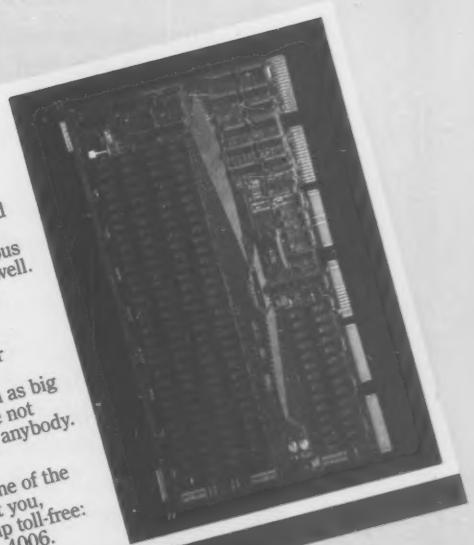
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because this model encourages retrieval by data content rather than by data location and thus brings the data base machine technology closer to the ideally independent state that exists between, for example, a person and a dictionary. A direct by-product of this retrieval-by-content-rather-than-by-location facility is an ability to talk to the data base in a language that more closely approximates the user's normal language. This ability is extremely important because it has the greatest impact on the end user's perceptions of friendliness and ease of use, which are the ultimate measures of a given technology's staying power.

#### Associative Memory

The most intriguing product in the following survey is Corem's Synfobase, which, to our knowledge, is the first commercial implementation of a relational model connected to an associative memory, also known as a content addressable parallel processor (Capp).

The concept is exciting. Imagine a block of tuples that can be "swept" by a search argument. Each tuple that matches the argument is extracted from the block and massaged/formatted for the host. The search argument can be masked to do true interpolations (extract meaningful responses from incomplete or ambiguous inputs).

Synfobase's associative memory is refilled from a common store (the data base) and again "swept" until all the relevant data is extracted from the file. There are unsatisfied arguments about whether the file records should be third-normal tuples or binary relations. Synfobase uses tuples drawn from a relational model.

Associative memory techniques are not new. One can find journal articles dating back to the 1960s that deal with the techniques, and associative concepts were written about in the '50s. Several companies, notably IBM and Goodyear Aerospace, built and experimented with associative memories to demonstrate conclusively their advantages. The major barrier to the large-scale use of associative techniques in commercial systems has been cost.

Associative memories offer two distinct advantages. The first advantage derives from the simple conversion of a serial operation into a parallel operation. An associative memory converts many serial comparisons applied record by record into one compare operation applied to "n" records at the same time, where the value of n is limited only by the size of the memory. Processing speed is improved practically as a function of n.

The second advantage derives from the way the data is accessed. All nonassociative techniques ultimately yield a discrete address that defines an intersection in a random-access memory (RAM) or that activates/alerts a read/write head for some dis-

crete spot on a disk surface. A physical address must always be developed to point to some real location in memory.

An associative memory also holds data in discrete physical locations, but the locations' addresses are unimportant. All of the locations are "addressed" at the same time according to their data contents, but only the locations whose data contents match the search argument are actually accessed. The indexes and other

structures that must straddle a non-associative data base to translate from generalized query to precise physical address are effectively compressed into the search argument.

The cost barrier is simply the cost of memory. The entire data base should be implemented in semiconductor associative memory to realize the speed advantages gained through parallelism and nonindexed retrievals.

A full-scale implementation is not

quite yet practicable, but Synfobase demonstrates that an inexpensive hybrid configuration can be implemented with today's circuits. Synfobase consists of a standard data base in the relational model stored on disk. The tuples are constrained to 255-byte limits. The tuples are transferred to a separate 8K-byte associative memory in blocks of 32. An extra byte is added to each tuple for the system's use.

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# DATA BASE MACHINES

In Depth/8

## IN DEPTH

scanned simultaneously with a search argument. Respondent words are transferred elsewhere for further processing and formatting. Another 32 tuples are dumped into the memory, and the

process is repeated.

The implication is that the contents of the entire disk file must flow through the 8K associative "pipe" in response to each query. Corem gives a disk-to-associative-

memory transfer rate of 150K to 200K byte/sec, which means it would take about a minute to sweep a 10M-byte file. Obviously, relevant relations could be preselected through a dictionary, but

that procedure reintroduces indexes into an ideally indexless data base.

The end result is a partially indexed, partially associative data base that can probably work very well for small

data bases connected to very small computers. And at well under \$10,000, that just about sums up the currently practical application for associative data bases in the style of Synbase. However, the associative technique could be applied at this point to the indexes of a standard pointer-based or relational DBMS because index sizes can be controlled far more easily than data base sizes. In fact, a high-speed data base machine fitted with associative indexes would be feasible, relatively inexpensive... and practically irresistible.

### Surveying the Field

Following is a survey of data base machines from six companies: Britton-Lee, Mega/Net Corp., Intel Corp., Amperif Corp., HDR Systems, Inc. and Corem.

### Britton-Lee

Britton-Lee's IDM (Intelligent Data Base Machine) was one of the first extracted-function data base machines to appear on the market. It was originally offered exclusively as an OEM product. The OEM's basic chores are to develop the host driver software to accommodate the IDM communications protocol and host parser software to translate user commands into the internal IDM format.

Britton-Lee still offers the OEM products (the IDM 200/500 models), but now also provides end-user products (the IDM 300/600 models) fully adapted for use with Digital Equipment Corp. PDP-11 and VAX computers operating under VMS or Bell Laboratories' Unix. Britton-Lee currently claims about 125 IDMs installed and operating on a variety of mainframes and minis.

The general architecture of the IDM has the established minicomputer look. It consists of up to six distinct functions clustered around a single high-speed bus. The bottom-of-the-line IDM 200/1 offers a 1M-byte main memory, a four-drive disk controller and an eight-host RS-232C or IEEE 488 interface. The interface can be expanded to handle up to 24 hosts, and an eight-drive tape controller can be added.

The IDM 500/1's main memory can be increased from 1M bytes to 6M bytes, three more disk controllers can be added to a maximum capacity of 16 drives and the

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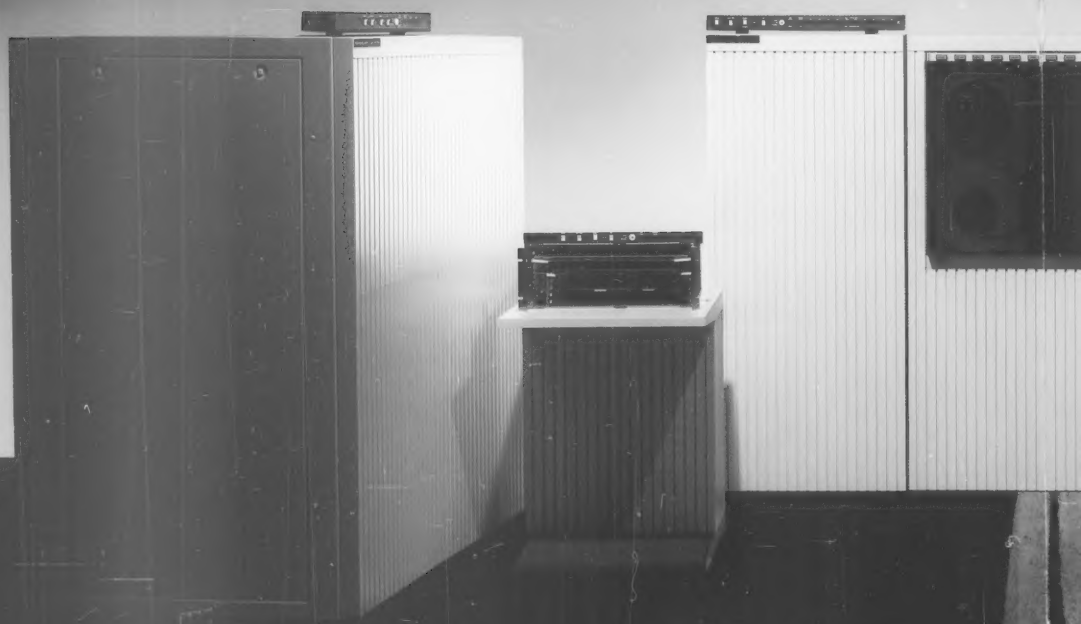
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## 114

## IN DEPTH

interface can be expanded to accommodate up to 64 hosts. The IDM 500/2 is similar, but comes with a standard 2M-byte memory.

All of the IDM models have an identical data base processor, which is a dedicated micro with hardware and software optimized to execute DBMS functions. The data base processor is the functional equivalent of the kernel in a software DBMS.

Finally, the IDM 500/2 offers an interesting "data base accelerator,"

which is another special-purpose micro with a three-stage pipeline architecture and an advertised 10 million instruction per second (Mips) execution rate. It can initiate disk operations and can search disk pages while the pages are being transferred into memory. The accelerator allows most of the tedious compare/sort/merge tasks to be moved even closer to the disk interface to filter out query-relevant data before the data is submitted to the data base processor. Britton-

Lee claims that the accelerator can improve IDM operations by a factor of up to 10.

Auxiliary IDM facilities are comparable to the facilities supplied by standard software DBMS. Each IDM version comes complete with an integrated data dictionary, a transaction manager, audit logging, an access control mechanism and an on-line dump facility to support backup/recovery tasks. The IDM also supports random-access nonrelational files for

storing program and text data.

The IDM 300 and 600 systems are based on the IDM 200 and 500, respectively. Each system is supplied complete with all the necessary driver and parsing software plus an on-line query capability, a data entry facility, a report writer and interfaces to application programs written in Cobol, Fortran and C.

**Pricing and support.** Britton-Lee quoted the following single-unit prices for IDM products as of March: IDM 200/1, \$35,000; IDM 500/1, \$60,000; IDM 500/2, \$85,000; IDM 300, \$54,500; and IDM 600, \$79,500. The IDM 300 and 600 are delivered with an unconditional 90-day warranty. Annual maintenance contracts are available.

### Mega/Net

The Mega/Net Distributed Data Base Machine is built by Digital American Computers, Inc. (DAC) and marketed through a dedicated outlet called Mega/Net Corp. DAC made its first Mega/Net delivery in 1981 and currently claims six installations. Most of DAC's marketing efforts appear to be focused on Europe. DAC highlights an installation in Holland throughout its sales literature and claims that several multi-million-dollar contracts are pending in Belgium, Sweden and the Netherlands. DAC has also opened negotiations with a European venture capital partnership for a \$2 million placement.

Mega/Net is an intriguing application of the independencies derived through an implementation of the relational model. DAC confidently claims that Mega/Net can operate equally well as a back-end data base machine (in the Britton-Lee IDM 500 style), as a data node in a telecommunications network (in this sense, Mega/Net functions as a "distributable" rather than as a "distributed" data base) and as a stand-alone transaction processor.

DAC offers some impressive specs to back up these claims: compatibility with X.25 and Xerox Corp.'s Ethernet, up to 16M bytes of main memory, up to 500G bytes of disk storage

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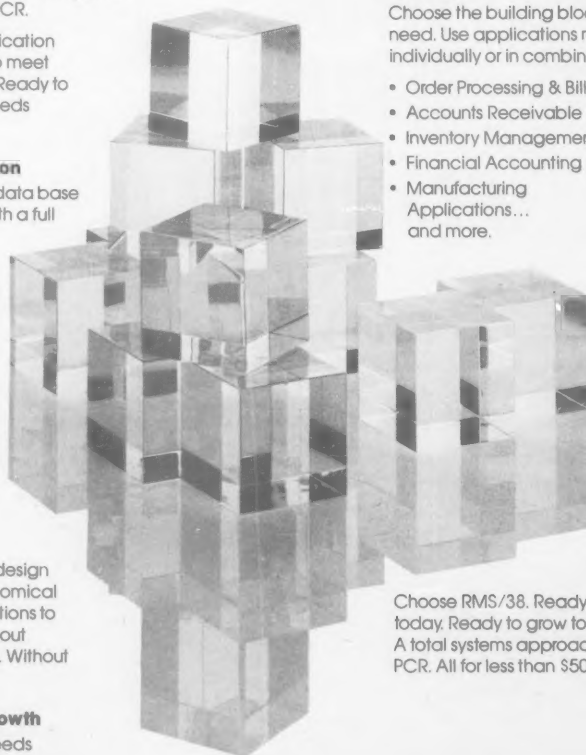
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(though apparently possible, note that 480 disk drives are needed to reach this impressive figure), up to 850 I/O ports and up to 128 communications lines.

The Mega/Net DBMS is called Action/OS (Acos). It consists of a relational data base, a data management language (S Basic), a query language (Easy/Info) and a report writer. The relational DBMS is a brute (see technical summary on In Depth/18), except for the out-of-character 64-attribute (domain) limitation on tuple definitions. It is dictionary driven, automatically manages disk space and supports four levels of data integrity, including an audit file for failure recovery. S Basic, Easy/Info and the report writer are relatively standard implementations of the genres.

**Pricing and support.** Mega/Net can be purchased or leased. The purchase price range is \$68,000 to \$350,000. Domestic purchases are vendor supported; European purchases are third-party supported.

### Intel

Intel is a corporate embodiment of the "lightning-growth-through-technology" phenomenon that seems to describe every computer-related start-up since 1950. Between 1973 and 1982, Intel's net revenues soared from \$66 million to almost \$1 billion.

This type of growth is not exceptional in the industry. Other companies — DEC, Data General Corp., Prime Computer, Inc. and Tandem Computers, Inc. come quickly to mind — have equaled or bettered Intel's record.

Unfortunately, the bright growth phenomenon also has a dark side. Many other companies have surged downward and outward even faster than lightning. Rapid technological change is, of course, one underlying explanation for both sides of the phenomenon, but another consistent cause for failure seems to be a company's reluctance to maintain its original entrepreneurial pressure throughout its period of success.

Here, Intel is a genuine exception. Not content with its premier position in the semiconductor marketplace (qualitatively; Texas Instruments, Inc. still has a quantitative edge), Intel acquired a major DBMS (System 2000) and established a separate Commercial Microsystems Operation (CMO) to explore and develop the integration of microcomputers and systems software.

Two products from CMO, both announced last year, are IDBP and Idis, which mean Data Base Processor and Data Base Information System, respectively. The IDBP reportedly supports any data model, including relational, and is intended as a back-end data base "engine" in the general style of the Britton-Lee IDM OEM products. Intel somewhat cutely refers to its custom interfacing as "per-

sonality" software, which translates to drivers and parsers, again in the Britton-Lee style.

The Idis 86/735 is also a data base engine, but it is intended strictly as an extension to the System 2000 DBMS. The premise is interesting. The Idis permits users to extract pointer-based schema from the System 2000. It then automatically reformats the schema data into relations. The general effect is that users are given a microprocessor-boosted rela-

tional view of schema-restricted System 2000 data components.

The approach is similar to Cincom Systems, Inc.'s software implementation of Logical User Views on the TIS offering and has the same inherent flaws. The extracted data can be manipulated through a subset of the relational calculus, and users gain some ability to join data groups that may reside as disjoint schema in the host file, but the benefits are only partial because changes, updates,

new relations and so on developed on the relational views cannot be fed back easily into the underlying System 2000 schema. Idis is thus largely a passive extension to System 2000.

The Idis operating environment is provided by Xenix (Microsoft, Inc.'s upgraded version of Unix), which supports the C programming language. Idis also supports Cobol and Fortran. An IBM 3270 pass-through option currently permits users to

(Continued on In Depth/19)

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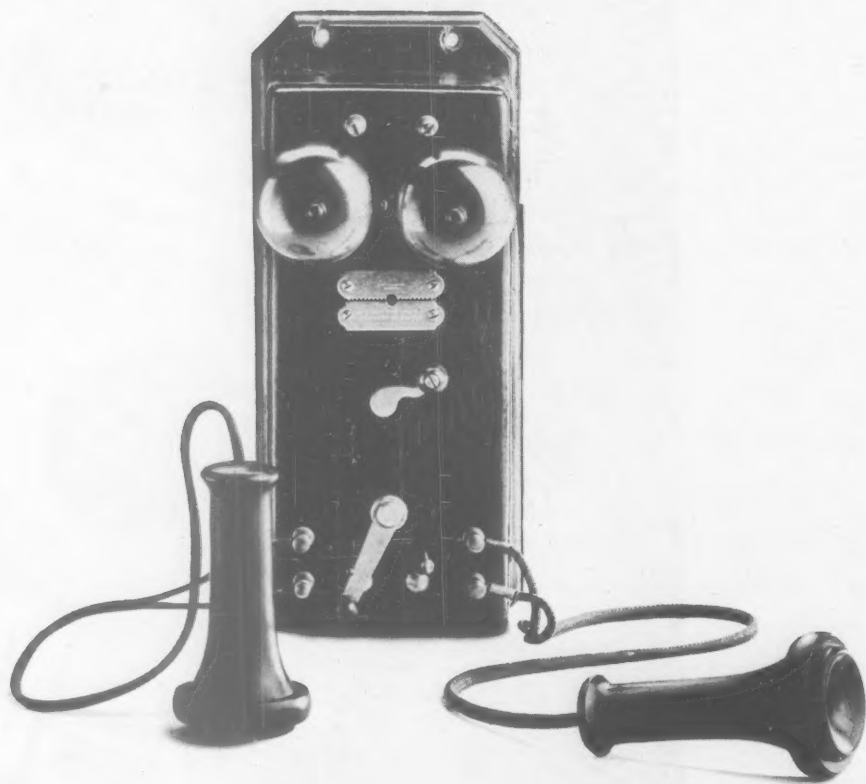
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## IN DEPTH

### A Technical Summary of Six Vendors' Products

**Amperif Corp.**  
21345 Lassen St., Chatsworth, Calif. 91311

**Product:** RDM 1100.

**Host system supported:** any Sperry 1100 series computer hardware and software.

**Data model:** relational.

**Technical summary:**  
Relations/data base: 32 x 10<sup>3</sup>  
Attributes/relation: 250  
Tuples/relation: 2 x 10<sup>9</sup>  
Maximum tuple width: 2,000 bytes  
Typical transaction rate: 5/sec

**HDR Systems, Inc.**  
8404 Indian Hills Drive, Omaha, Neb. 68114

**Product:** Noah.

**Host systems supported:** any, through RS-232C and IEEE 488 communications interfaces.

**Data model:** relational.

**Technical summary:**  
Tuples/relation: 2 x 10<sup>9</sup>  
Attributes/tuple: 250  
Maximum tuple width: 2,000 bytes  
Relations/data base: 32 x 10<sup>3</sup>  
Data bases/Noah: 50  
Maximum data capacity: 32 x 10<sup>9</sup>  
Clustering indexes/relation: 1  
Nonclustering  
indexes/relation: 255  
Keys/index: 15  
Processing rate: 2-5 trans./sec standard; 10-24 trans./sec with data base accelerator

**Corem International, Inc.**  
Subsidiary of AEG-Telefunken  
1517 Westbranch Drive, McLean, Va. 22102

**Product:** Synfobase — associative data base machine

**Data model:** relational.

**Technical summary:**  
Maximum tuple width: 255 bytes  
Attributes/tuple: 60  
Tuples/relation: unlimited

**Britton-Lee, Inc.**  
90 Albright Way, Los Gatos, Calif. 95030

**Products:** OEM: IDM 200/1, 500/1, 500/2; end user: IDM 300/600

**Hosts supported:** OEM products: any host; end-user products: DEC PDP-11 and VAX computers under VMS or Unix.

**Host languages supported:** end-user systems have interfaces for Cobol, Fortran and C.

**Data model:** relational.

**Technical summary:**

	200/1	500/1	500/2
Data bases/IDM		50 (all)	
Relations/data base		32 x 10 <sup>3</sup> (all)	
Attributes/relation		250 (all)	
Tuples/relation		2 x 10 <sup>9</sup> (all)	
Tuple width		2K bytes (all)	
Indexing		1 clustered, 254 nonclustered indexes/relation; 15 keys/index	
Disks (SMD-compatible)		4	16
Maximum no. of users	128	4,096	4,096
Maximum no. of host systems	24	64	64
Processing rate (trans./sec)		2-5	10-24

**Mega/Net Corp.**  
806 Rt. 17, Ramsey, N.J. 07446

**Worldwide distributors for**  
**Digital American Computers, Inc.**  
(same address and phone number)

**Product:** Mega/Net Distributed Data Base Machine, Models I, II and III.

**Hosts supported:** any computer compatible with X.25 or Ethernet.

**Data model:** relational.

**Technical summary:**

Domains/tuple: 64  
Bytes/domain: 1K  
Maximum tuple width: 64K bytes  
Tuples/relation: unlimited  
Relations/data base: unlimited  
Data bases/Mega/Net: unlimited  
Maximum file size: 500G bytes

**Hardware summary:**

Main memory: 512K to 16M bytes  
Internal word size: 32 bits  
Maximum no. of disk drives: 480: 30 controllers; 16 drives each; 80M-byte, 300M-byte, 600M-byte or 1.2G-byte drives  
Communications lines: 128  
I/O ports: 850  
Peripheral interfaces: RS-232C, IEEE 488, Ethernet  
Communications protocols: X.25, Ethernet, asynchronous  
Average processing rate: Mega/Net I & II: 40 trans./sec; III: 300 trans./sec

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**Intel Corp., Commercial Microsystems Operation**  
P.O. Box 9968, 12675 Research Blvd., Austin, Texas 78766

**Products:** IDBP 86/44X, Idis 86/735

**Technical summary: IDBP**

Data model: relational, network, hierarchical  
Items/record: 256  
Maximum record size: 1K byte  
Files/data base: 190  
Transaction rate: .75 trans./sec  
Maximum file size: 33M bytes  
Maximum no. of files: 64,000

**Technical summary: Idis**

Host systems supported: Sperry Corp., IBM, Control Data Corp.  
Operating software: Xenix  
Data model: relational  
Languages supported: C, Cobol, Fortran  
Tuples/relation: 2<sup>31</sup> -1  
Attributes/tuple: limited by machine memory size  
Relations/data base: 9,999  
Maximum data capacity: 35M bytes



## IN DEPTH

(Continued from In Depth/15) do multilingual compilations on the host. The basic Idis hardware package is supplied with 768K bytes of main memory, 35M bytes of Winchester-type hard disk and a 1M-byte floppy disk. Communications interfaces are RS-232C and 20-mA current loop.

**Pricing and support.** The Intel products are still relatively new, evolving configurations with correspondingly evolving prices. The IDBP products are in the range of \$60,000, and the Idis products are in the range of \$35,000. Ongoing support is available from Intel.

### Amperif

Amperif is a relatively little-known small company lodged in a comfortable niche of Sperry and IBM plug-compatible peripherals. Amperif's other products are disks, tapes and disk caches. The RDM 1100 is an anomaly in this product lineup because it is a strictly state-of-the-art hardware implementation of an advanced software concept. More, it is not simply an extracted-function configuration that offloads portions of the host's software DBMS; it is a dedicated-function data base machine that relieves the host of the entire DBMS chore. This characteristic makes it a single-host equivalent of Britton-Lee's IDM products, which is no mean task for a plug-compatible peripherals company. RDM claims three RDM 1100 installations.

The RDM 1100's specifications are remarkably similar to those of the Britton-Lee IDM 500. Its internal architecture is somewhat simpler, though it also adheres to the predictable single-bus architecture.

An I/O channel interface in the RDM 1100 connects to the Sperry host through either a word or byte channel. The host contains only driver and parser/screen formatter software. The interface connection parses queries rendered in RDM 1100 Relational Query Language (RQL) and calls from applications programs. The queries and calls are handled in the RDM 1100 by an integral data base processor. A separate disk controller with disk cache manages disk accesses.

The RDM 1100 does not have a preprocessor similar

to the IDM 500's accelerator. The accessed data is handled by the data base processor, and only the query/call-responsive results are submitted to the host.

All data base structuring/

maintenance chores are handled through the RDM 1100 RQL. Other internal software/firmware builds and maintains a dictionary, automatically logs file transactions, dumps/loads data, op-

timizes disk access methods and manages security. The RDM 1100 can be ported to up to five different hosts; internal software manages multiple concurrent accesses. The standard configuration

includes two 600M-byte disks, but can be expanded to a maximum capacity of 10G bytes of disk storage.

**Pricing and support.** Amperif quotes a single-unit price of \$240,000 for a

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Development tools for custom file transfer	FORTE PC78-2	IRMA
High-speed on-board microprocessor will not burden PC's microprocessor with communications responsibility	FORTE PC78-2	IRMA
Resident start-up diagnostics assure there will be no network contact or coaxial connection unless the PC and interface board pass the self-test	FORTE PC78-2	IRMA
MS-DOS compatible Async on-board RS232 serial communications interface for printer or modem	FORTE PC78-2	IRMA requires separate board
All software for communications processor and for the 3278 emulator are on diskette. Enhancements and upgrades such as new terminal emulations and new terminal feature support (i.e., custom file transfers) are made by new diskette release — which can be instituted by users rather than technicians	FORTE PC78-2	IRMA uses PROM memory — PC cabinet must be open to upgrade firmware on interface board
Externally visible status indicators (five LEDs) provide visual confirmation of communications activity for both coax and RS232 interfaces. Particularly helpful on installation and problem determination	FORTE PC78-2	With IRMA, one LED can be examined by opening PC's cabinet
Error-checking via Byte Parity for on-board communications buffer provides consistency in the error-checking system from the cluster controller to the PC, insuring that the communications board could never be a weak link in the error-checking system.	FORTE PC78-2	NOBODY!
Extensive diagnostics supplied. Menu-driven installation diagnostics as well as remote diagnostic capability (provided via on-board RS232 interface). Problem determination through phone lines rather than on-site visits	FORTE PC78-2	NOBODY!
Board address selection is switch-selectable (resolving potential conflicts with non-IBM boards in your PC)	FORTE PC78-2	NOBODY!
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## IN DEPTH

minimum (two-disk) configuration. Ongoing support is available from East and West Coast service centers.

### HDR

HDR is not a well-known company in DP circles but is a very well-known, multimillion-dollar company in the business of architectural design. A couple of years ago, HDR went shopping for a data base for its

architectural business and eventually settled on Britton-Lee's IDM. At some point during their association, HDR asked why Britton-Lee had not built a general-purpose driver/parser interface for the IDM. Britton-Lee was apparently not interested but licensed HDR to build one around an IDM kernel. The result was Noah.

The body of Noah is any of the IDM 200 or 500 configurations, including the data base accelerator op-

tion. The HDR-designed portion of Noah is a query processor, which is an independent microprocessor-driven unit that accepts RS-232C or IEEE 488 communications from any host, passes the host commands/data through a Structured Query Language (SQL) parser and accesses the IDM. On the return path, the query processor formats the IDM data into a host-acceptable response for delivery through the communications interface. Noah can be supplied with

up to 12 query processors.

In addition to HDR's consolidated SQL parsing software, HDR offers a superset of IBM's SQL, called SQL/Noah, for generalized query operations with Noah.

Noah can be used in multiple-host, stand-alone mode or as a data base node in a communications network. Network operation requires a separate gateway processor. HDR illustrates Noah's use in a Datapoint Corp. Arcnet configuration. The gateway processor is a dedicated Datapoint 8602 or 8830 computer executing a combination of HDR and Datapoint software.

**Pricing and support.** Noah can be purchased, lease-purchased or leased. It is offered in several configurations with a hefty selection of options. Prices range from \$98,200 for an IDM 200-based stand-alone system to \$145,400 for an IDM 500-based Noah designed to be used in Arcnet. A gateway processor costs another \$14,500 or \$39,500. HDR provides training and support for additional fees.

### Corem International

Synfobase from Corem International is the first commercially available implementation of associative memory techniques applied to a relational data base. Critics of the relational model have pointed out that a true (complete) implementation of E.F. Codd's original model requires associative memory. The Corem technique was devised by Sydney Lamb, a linguistics professor from Rice University, and developed by Semionics Associates of Houston. It was acquired exclusively by AEG-Telefunken, which now markets the Synfobase end product through Corem.

Synfobase is built around a Zilog, Inc. Z80 micro with 64K bytes of RAM, up to 10M bytes of Winchester disk and 8K bytes of associative memory. Data is called from the disk in chunks of 32 tuples. All 32 tuples are queried in parallel, and "respondent" tuples are retained. The process repeats until the disk is read.

The disk-to-associative-memory transfer rate is about 200K byte/sec, which means that just under a minute is required to "associate" a 10M-byte disk. This time is probably acceptable in the mini/micro market for which Synfobase is intended, but the product does not look too promising in its present form for larger computers.

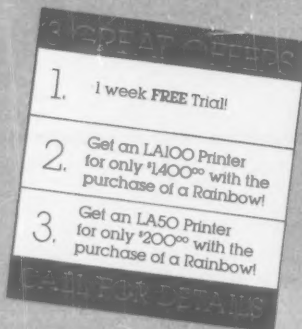
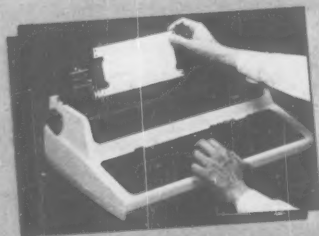
**Pricing and support.** The 5M-byte version of Synfobase costs \$7,600, the 10M-byte version, \$8,900. They can be leased for \$600/mo and \$700/mo, respectively. Service and maintenance are priced separately.

### About the Author

Vincent C. Rauzino is new product development manager for Data Decisions in Cherry Hill, N.J.

The material in this article is based on information in Software, a monthly updated looseleaf information service.

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## Reflects 20% Drop in Memory Costs

# IBM Cuts Prices, Maintenance Charges

WHITE PLAINS, N.Y. — IBM has announced decreases in the purchase price and minimum maintenance charges for selected models of its 3033, 3081, 3083 and 3084 processors and the 3082 processor controller. The firm also has cut the price of its line of 3350 direct-access storage devices.

The system price reductions reflect a 20% decrease in the cost of incremental memory for the 3080 series. A vendor spokesman said the price per 1M byte of incremental memory has dropped from \$25,000 to \$20,000. From a system point of view, the overall purchase price of a typical configuration has been reduced between 1% to 4%. The lower purchase prices will become effective May 24.

For example, the price of an IBM 3081 Model D24 will go from \$3,460,000 to \$3,420,000. The 3081 Model K48's price will decrease from \$4,660 to \$4,500. The 3083 Model E16 will cost \$1,280,000 instead of the current \$1,320,000. The price of the 3083 Model J32 will go from \$3,020,000 to \$2,900,000.

Monthly maintenance charges reportedly have decreased about 15% for IBM 3081, 3083, 3084 and 3033 processors and 3082 controllers. The effective reductions range from 11.7% to 14.8% for 3080 series processors and approximately 11.5% for

3033 processors, the vendor noted. For example, minimum maintenance charges for the IBM 3033 Model S4 will decrease from \$4,145 to \$3,525. For the 3033 Model M16, the maintenance charge will drop from

(Continued on Page 64)

## Centronics Offers Band Printers, Enhances Matrix Printer Line

By Bob Johnson

CW New York Bureau

NEW YORK — Centronics Data Computer Corp. has introduced a series of line band printers as well as additions to its existing line of dot matrix printers.

The Linewriter 400, first in Centronics' new series, offers a full range of print bands including statistical bands in 48-, 64-, 96- and 128-char. sets. The printer utilizes linear free-flight print hammers at low band speed, which strike the paper at right angles, producing better quality

printing, according to the company.

Built-in self-diagnostics are standard on the Linewriter 400, as is a compressed pitch capability, which enables it to print in either a 10 char./in. or 15 char./in. format. Cost for the Linewriter 400 is about \$5,000, and it will be available this fall.

The two end-user additions to Centronics' Printstation 350 series of dot matrix printers include Models 357 and 358. Model 357 is a heavy-duty, high-speed, DP-oriented printer designed to print at

(Continued on Page 62)

## A.B. Dick, GEC Join to Develop Supermini

CHICAGO — In a joint development effort, A.B. Dick and fellow General Electric Co. subsidiary, GEC Computers, Ltd., have produced an OEM-oriented superminicomputer being aimed at both scientific and commercial applications.

Capable of supporting up to 256 termi-

nals, the MC-30 processes 2.8 million instructions per second (Mips) when used in business environments. Depending on the configuration, the 32-bit system costs between \$40,000 and \$100,000.

According to the firm, the MC-30 achieves its processing speed through an

overlapping execution of four instructions simultaneously via a four-stage pipeline. The instruction overlap, or pipelining, is accomplished by separating each instruction into four phases: instruction fetch, address preparation, operand fetch and execution.

The modularly designed machine supports a mix of up to 11 memory boards (1M byte each) and channel controllers (disk and tape handlers and local system multiplexers), the company said. A single disk controller handles as many as 32 spindles and a tape controller up to eight tape handlers. Local system multiplexers supply a printer interface, local and remote console interfaces and system timers.

The system uses 64K-bit dynamic random-access memory chips and a memory subsystem expandable to 16M bytes. Compatible programming languages include C, Pascal, Basic, Fortran and Cobol, plus a relational data base management system and applications generator. All languages can be executed under Unix and Whitesmiths, Ltd.'s Idris operating systems.

The system is expected to be available to OEMs in August, both through A.B. Dick Systems Products Division and the London-based GEC Computers Ltd., an A.B. Dick spokesman said from 5700 W. Touhy Ave., Chicago, Ill. 60648.



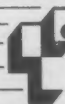
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## DG Upgrades CS/40, 60 To Add Terminals

WESTBORO, Mass. — Data General Corp. has announced upgrade availability for its CS/40 and CS/60 computer systems that allows both systems to handle more terminals.

The upgrade reportedly allows current users to add more terminals and achieve more processing power by migrating to the firm's CS Series 200 sys-

tem. The 200B allows as many as 25 terminals to be connected — a 16-terminal and nine-terminal increase over the CS/40 and CS/60, respectively.

The cost of upgrading the CS/40 CPU is \$22,000, and the CS/60 can be upgraded for \$10,500, a spokesman said from 4400 Computer Drive, Westboro, Mass. 01580.

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## Hotsite Provides Disaster Backup

NILES, Ohio — RMI Co. has announced the availability of an IBM 4300 facility dedicated to disaster recovery backup service for users of small and medium-size systems.

Designed to accommodate 100 users, Hotsite is fully equipped with an IBM 4341 Group II computer, tapes, disks, CRT terminals and communications equipment, which reportedly will be available whenever a subscriber experiences a computer emergency.

The facility is said to feature a security system with 24-hour guard service, remote television monitoring on the site perimeter and a magnetic-card entry system. Inside, there are heat, smoke and water detectors; a fire protection system; and surveillance cameras. Also, the Hotsite power system was

designed to be uninterruptible and to incorporate battery backup. A helipad, plus a location within an hour from two major airports, provides immediate access in an emergency.

Subscribers reportedly pay only for the size of the system needed and are encouraged to test the facility on a regular basis in accordance with their needs. On-

site technical support is also offered. Subscription to a backup site can qualify the user for a reduction in insurance premiums for business interruption coverage, according to the vendor.

Depending upon customer requirements, monthly charges range from \$1,000 to \$3,000, the vendor said from 1000 Warren Ave., Niles, Ohio 44446.

## System Out For Horizon

SAN LEANDRO, Calif. — North Star Computers, Inc. has announced a new operating system for its Horizon microcomputer, the Horizon 8/16 system.

North Star Turbodos is a multiprocessor operating system and will handle up to eight users.

Deliveries are slated for August. Prices start at \$9,000 for a four-user system, the firm said from 14440 Catalina St., San Leandro, Calif. 94577.

## Line Printers Introduced

(Continued from Page 61)

400 char./sec. Character generation is seven by eight dot matrix with true ninth pin underlining.

Printer throughput is over 350 line/min for 40-col. lines, Centronics said. It will also be available this fall and is priced at \$2,995.

Model 358 is a dual-mode printer providing bidirectional draft, multipass correspondence-quality printing and four-color or seven-color print capability. It also includes an LCD with printer status and features selection and a rotary ribbon shifter system. It will be available this fall for \$3,595.

An automatic sheet feeder designed for the Model 358 was also announced. It is controlled either by a host computer or through the printer's control panel. It is also available this fall and is priced at \$795.

More information is available from the vendor at Hudson, N.H. 03051.

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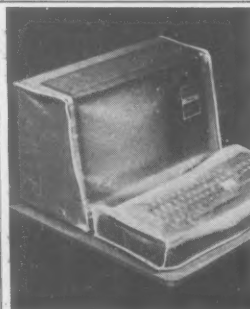
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## IEEE 796 Bus-Compatible

## Comark Unwraps Storage System

MEDFIELD, Mass. — Comark Corp. has unveiled a ½-in. magnetic tape mass storage system said to be IEEE 796 bus-compatible.

The MT 86 Magnetic Tape System reportedly provides the users of the IEEE 796 bus with a mass storage system capable of direct-memory-access transfers to and from memory at a 120K byte/sec rate with 24-bit addressing. The MT 86 runs with industry-standard Digi-Data Corp. drives in either seven- or nine-track Nonreturn to Zero Inverted (NRZI) or nine-track dual-density

phase-encoded (NRZI/PE) formats. Tape speeds of up to 125 in./sec are available.

The system consists of three items: the magnetic tape transport, the tape formatters and the MT 86 interface card. When connected to the Digi-Data formatter, the system reportedly is capable of controlling up to eight transports. Transports are available in 7-, 8½- and 10½-

in. reels with speeds up to 75 in./sec single (NRZI) or double density (NRZI/PE).

Software drivers for Digital Research, Inc.'s CP/M, Microsoft, Inc.'s MS-DOS and Intel Corp.'s Isis are available.

Prices start at \$5,170 for the MT 86/7980. Comark is located at 93 West St., P.O. Box 474, Medfield, Mass. 02052.

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## Sunol System Features More Storage

PLEASANTON, Calif. — Sunol Systems, Inc. has introduced a Corvus Systems, Inc.-compatible mass storage system with an advanced recording technique said to provide up to 50% more usable capacity.

The firm's method is to use run-length-limited coding on 5¼-in. Winchester disk drives. A standard 12M-byte Winchester disk, after formatting, has 10M bytes of usable storage, while Sunol's method results in 14M bytes of usable storage, according to the vendor.

Not only is the capacity increased, the vendor claimed, but the transfer rate is changed from 5M to 7.5M bit/sec. A 7M-byte disk costs \$1,995; a 14M-byte disk costs \$2,495; a 21M-byte disk costs \$2,995; and a 44M-byte disk costs \$4,495, all formatted, the vendor said.

The firm can be reached through P.O. Box 1777, 1072 Serpentine Lane, Pleasanton, Calif. 94566.

## Subsystem Fits Series/1

ANAHEIM, Calif. — Datum, Inc. has announced an extra-capacity, ¼-in. cartridge tape streaming subsystem for the IBM Series/1 computer.

The DSC 50X subsystem has a total formatted capacity of 45M bytes on nine tracks, the vendor said, and recording density is 8,000 bit/in. Up to 45M bytes of formatted data can reportedly be transferred from disk to tape in nine minutes, with a sustainable transfer rate of 5M byte/min.

The product is priced at under \$5,000. Datum is located at 1363 S. State College Blvd., Anaheim, Calif. 92806.

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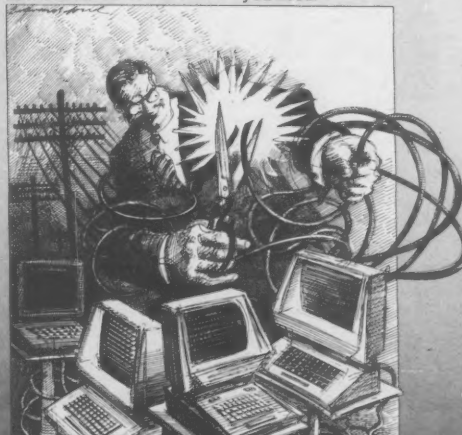
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## Encrypt/Decrypt Device Bows

LITTLE SILVER, N.J. — Nu Data Corp. has announced an encrypt/decrypt device designed to protect data from going into a computer file or being transmitted over communications lines.

Called the Encryption Decryption Data Interface Equipment (Eddie), the microprocessor-based unit connects between the terminal and the modem or processor. The unit was designed to op-

erate in asynchronous or synchronous environments, the vendor said.

Aimed primarily at banks, insurance companies, investment houses or other organizations where security of transmitted data is essential, the device employs a parity code set up on a 64-key internal switch. Eddie can encrypt and decrypt 64-bit data words with the algorithm specified by the Federal Data Encryption Standard (DES

46), the vendor said.

For maximum security applications, Eddie is available with an option that allows random code changes during transmission based on a specified time lapse or block transmission.

Other features include the ability to operate from 50 to 19.2K bit/sec and loop-back keys for testing.

Eddie costs \$1,983 from 32 Fairview Ave., P.O. Box 125, Little Silver, N.J. 07739.

## Daisywheel Printer Available In Parallel, Serial Formats

PISCATAWAY, N.J. — Brother International Corp. has announced the HR-15, a two-color daisywheel printer available in both parallel and serial formats.

Capable of producing letter-quality hard copy in red and black, the HR-15 features a cassette daisywheel print element, 3K bytes of memory, which can retain information when the power

is off, and an 800 char./min print speed, the vendor said.

In addition, the HR-15 features proportional spacing and pitch selectors and bidirectional printout from memory.

The parallel version of the HR-15 costs \$599, and the serial version costs \$649, the vendor said from 8 Corporate Place, Piscataway, N.J. 08854.

## IBM Cuts CPU Prices

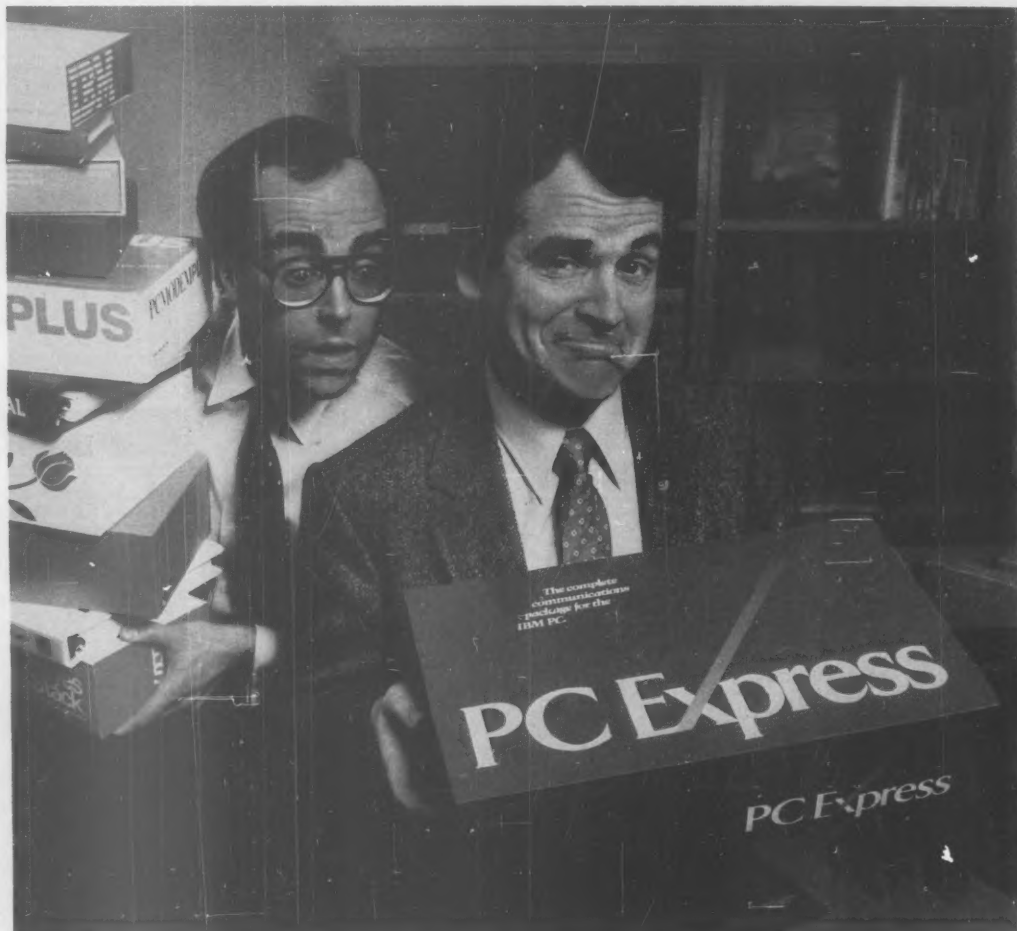
(Continued from Page 61)

\$6,570 to \$5,825. For the IBM 3084, minimum maintenance charges for the Model 064 will decrease from \$12,845 to \$11,110. These reductions become effective June 1.

For users who convert from IBM 3081 Model D16 to Model D24, the purchase price will go from \$200,000 to \$160,000. A conversion from a 3084 Model Q32 to Model Q48 will decrease in price from \$400,000 to \$320,000.

IBM's new pricing scheme represents a 23% reduction in the purchase price of IBM 3350 direct-access storage devices, the vendor said. These lower prices will become effective for machines installed on or after May 24 for customers under an IBM 3350 direct-access storage volume procurement amendment.

Full information on the price changes can be obtained from IBM, 1133 Westchester Ave., White Plains, N.Y. 10604.



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## Momentum Offers Version Of 32/4 Supermicrocomputer

SUNNYVALE, Calif. — Momentum Computer Systems International has unveiled an alphanumeric version of its 16/32-bit Momentum 32/4 supermicrocomputer.

The alphanumeric 32/4 is based around Motorola, Inc.'s M68000 microprocessor and features direct memory access, a proprietary memory management unit,

5M bytes of main memory and is compatible with the Unix operating system.

Also included as standard equipment are an alphanumeric display controller board and a 12-in. green-phosphor screen.

The computer is priced at \$9,995 for single quantities from the vendor at 965 W. Maude Ave., Sunnyvale, Calif. 94086.

## Pen Plotter Out for IBM Clusters

CONCORD, Calif. — Nicolet Zeta Corp. has announced the Zeta 887, a 20 in./sec pen plotter for users of IBM's 3274 and 3276 cluster control units.

Compatible with IBM's Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) environment, the Zeta 887 eight-pen plotter uses continuous feed media allowing users to generate multiple plots without operator intervention,

the vendor said.

Plots can be created on translucent bond, glossy bond or vellum. In addition, the unit reportedly can create plots on a clear inking film for overhead projectors.

The Zeta 887 is attached to the IBM cluster controller in a manner similar to the IBM 3387 printer. Commands required to drive the Zeta 887 can be generated by any applications program that uses industry-standard plotting

routines, the vendor said.

The Zeta 887 costs \$7,950 and will be available in July. More information is available from the vendor, which can be reached through P.O. Box 4003, Concord, Calif. 94524.

## EDS Unveils Update Of Its 290

CREVE COEUR, Mo. — Electronic Data Systems, Inc. (EDS) has announced an enhanced version of its 290 microcomputer-based terminal that will be used with the firm's distributed health care system.

The EDS 2900 intelligent terminal features include improved performance (three times the internal speed of the 290), up to 64K bytes of main memory (twice the capacity of the 290), a detached keyboard, touch-sensitive screen controls and a badge reader, according to the vendor.

Optional features include a bar code wand reader, a built-in 5M-byte Winchester disk, an attached Winchester disk drive offering up to 160M bytes of storage, multiple line or character printers and support for Digital Research, Inc.'s CP/M operating system.

A company spokesman said the EDS 2900 was designed principally to operate in the firm's Patient Care Information System, but it can also be used as a stand-alone microcomputer operating under CP/M.

The EDS 2900 is compatible with existing Model 290 terminals and costs \$8,000, the vendor said from Suite 150, 12747 Olive St., Bellerive Corporate Center II, Creve Coeur, Mo. 63141.

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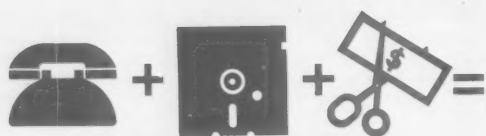
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## Bits & Pieces

### Sola Electric Introduces Uninterruptible Systems

ELK GROVE VILLAGE, Ill. — Two newly developed uninterruptible power systems (UPS) have been introduced here by Sola Electric Co.

The High Inrush unit is designed to accommodate loads requiring momentary current surges, and the Deluxe Mini-UPS features automatic inverter restart plus an alarm circuit for signaling battery operation.

Both products are said to protect small electronic equipment from all potential ac power line problems, including blackouts, brownouts, transients and noise, the vendor noted.

Pricing on these products is set at \$2,346 and \$1,808, respectively, the

vendor said from 1717 Busse Road, Elk Grove Village, Ill. 60007.

### Ink-Jet Printers Series Gets Price Cuts, Enhancements

CHELMSFORD, Mass. — Advanced Color Technology, Inc. has announced price cuts and product enhancements to its Act-1 line of color ink-jet printers.

The price reductions, averaging about 13% on standard printer products, bring the price of the Parallel Interface Act-1 down to \$7,890 from \$9,000 and the price of a RS-170 Video Interface Act-1 to \$8,795 from \$9,975, the vendor said.

At the same time, the vendor announced interfacing additions to the product line, including the RS-232 serial communications interface and a parallel interface multiplexing option.

Further details may be obtained from the vendor at 21 Alpha Road, Chelmsford, Mass. 01824.

### Memory Storage Unit Out For IBM Personal Computer

LOS ANGELES — A supercharger for the IBM Personal Computer, which provides random-access and transfer characteristics for up to 4M bytes of data, has been announced by CTC Electronics.

CTC Quick Disc is a semiconductor memory storage product that appears to the Personal Computer as an additional disk drive, the company claimed. It may be used as a permanent storage file or as a cache buffer in combination with existing Winchester disks and floppy drives, according to a vendor spokesman.

In the cache mode, frequently referenced sectors from disk are retained in buffers giving access of 512 bytes/.0015 sec for each reference after the first.

Storage capacity ranges from 128K bytes to 4M bytes with the low-end version priced at \$1,130 from 2237 Colby Ave., Los Angeles, Calif. 90064.

### Cartridge Drive Compatible With Intel Multibus Systems

JESSUP, Md. — Digi-Data Corp. has announced a cartridge drive that operates as an intelligent bus slave with any Intel Corp. Multibus-compatible system.

Called the Model 70M, the Intel 8085-based controller card plugs into the Multibus and supports up to four drives.

The controller has a 2K-byte buffer, expandable to 8K bytes. Maximum transfer rate is 50K byte/sec between buffer and host. Record length of 512 to 8192 bytes is allowed with a maximum capacity of 15M bytes. The effective storage rate is .67M byte/min, a spokesman said.

On-board firmware allows tape-to-tape copy without host intervention. The system includes a utility for Winchester tape backup on 8-in. or 5¼-in. floppy disks.

The product costs \$2,290 from Digi-Data at 8580 Dorsey Run Road, Jessup, Md. 20794.

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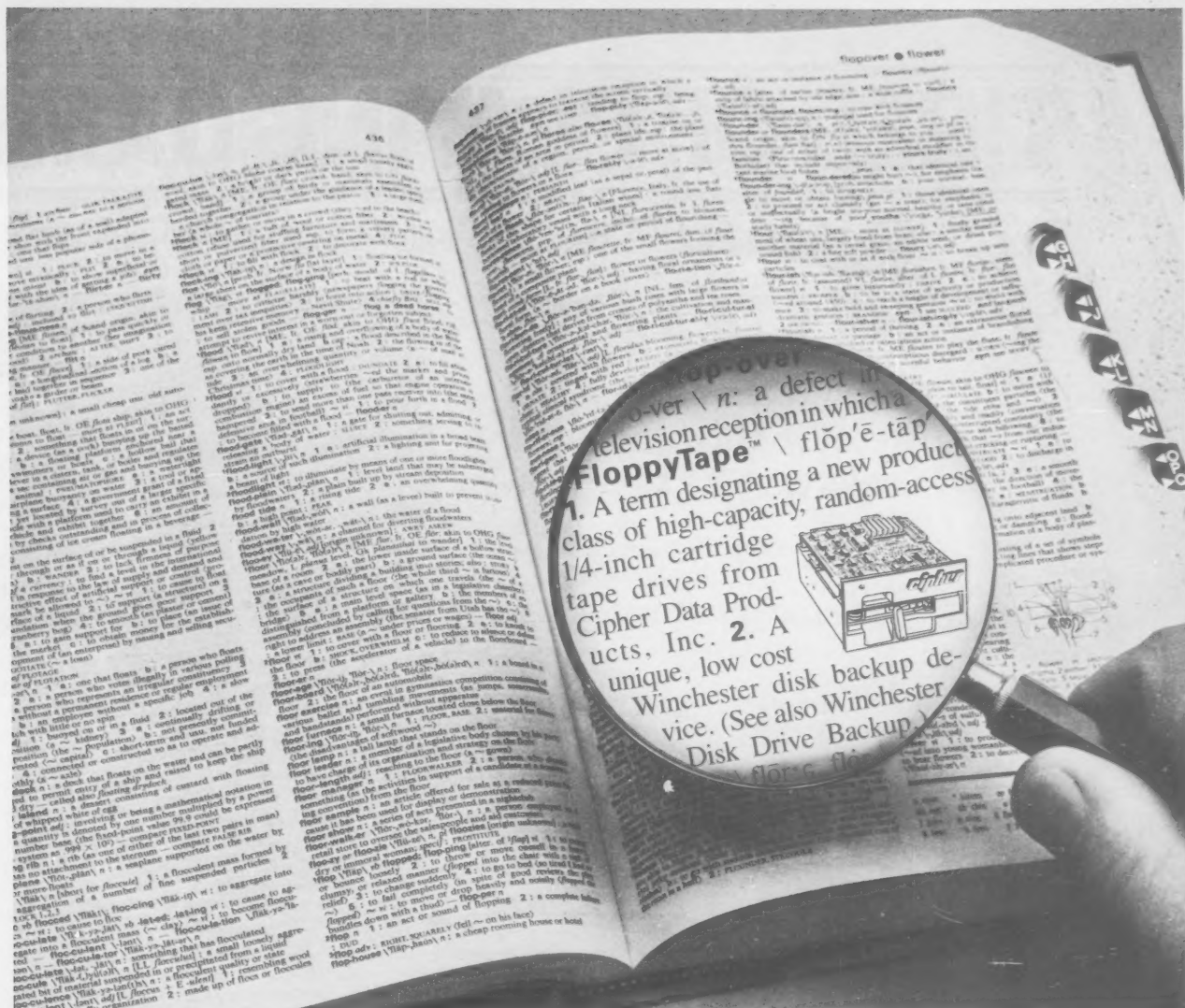
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## The latest word in computer peripherals...

### ...and the last word in disk backup.

**The 525-CT FloppyTape is a new class of product** that provides the last word in Winchester disk drive backup with its many unique design features. Using the standard 1/4-inch tape cartridge, this innovative device combines low cost, high capacity, and disk-type data accessibility to provide disk backup features with new meanings:

**Low Price 1.** Sells for appreciably less than any other device with comparable features. **2.** Priced at \$300 per unit in large OEM quantities.

**High Capacity Storage 1.** Stores 32 unformatted megabytes of data on a standard 1/4-inch tape cartridge. **2.** Allows one tape cartridge to replace up to 40 double-sided, double-density floppy disks.

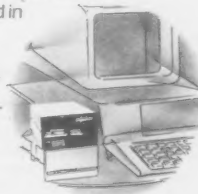
**Floppy Disk Emulation 1.** Configures a standard 1/4-inch tape cartridge with important floppy disk features such as random access to sectors and soft sector formatting. **2.** Allows in-place updating of information stored on the tape.

**Immediate Integration 1.** Attaches to standard floppy disk controllers. **2.** Provides plug compatibility with standard SA450 or SA850 interface connectors.

**Space Saving Design 1.** Packaged in the same compact form factor as the 5-1/4-inch floppy or Winchester disk drive. **2.** Designed with easy front panel loading and positive cartridge lock. **3.** Permits flat or side mounting.

So, let FloppyTape redefine your disk backup requirements. Next time you're in the market for the latest word in backup, just look it up...then hook it up.

**For a Further Definition**—Contact Cipher for a free 525-CT FloppyTape brochure, or for further information on other Cipher products.



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# TIRED OF PLAYING GAME

Sign up now for EMCE — The First Microcomputer Conference &



**Executive Microcomputer  
Conference & Exposition**

**June 23-25, 1983**

Sheraton Centre, New York, New York



If you want to learn how to select and use the micro-computing products and services that are revolutionizing business . . .

If you're tired of micro shows heavy on video games, but light on the serious applications you need to succeed . . .

EMCE is for you!

It's designed especially for executives who are responsible for the selection or use of micros in their organizations, executives who use micros as decision support tools, and business managers who employ (or want to employ) micros to manage their businesses.

## The Conference Program

**Thursday, June 23 & Friday, June 24**

The Thursday and Friday conference program is divided into four major "tracks," but you are not required to sign up for a particular group of sessions. You may select the sessions you need from any of the 48 sessions available and create a conference program designed to suit your unique information needs. You may even choose to attend one day instead of two if you want. A detailed agenda will be sent to you prior to the conference for your advance planning, so you don't waste a minute!

### Special General Session for Thursday Attendees:

The Revolt of the Masses: Micros and the Changing Rule of DP.  
(5:00-6:00 p.m.)  
*Dr. Michael Hammer, President, Hammer & Company*

### 1. Personal Computing in a Corporate Environment

For Executives in large corporations who are involved in using micros in distributed data processing or as standalone executive workstations, the EMCE conference program includes:

Keynote: Increasing Corporate Productivity via the Personal Computer (Thurs., 9:00-10:00 a.m.)  
*Maynard Rourke, Executive Director of Systems, Ford Motor Company*

The Executive/Professional Workstation (Thurs., 10:00-11:00 a.m.)  
*Evelyn Wilk, Consultant, Arthur Andersen & Co.*

DDP with Microcomputers (Thurs., 2:00-3:30 p.m.)  
Moderator: *Jerrold Eisen, President, Office Sciences International*  
Panelists: *Phil Dixon, MIS Manager, Apple Computer; Robert A. Miller, Special Assistant to the Deputy Secretary of Treasury, U.S. Treasury Department*

The Information Resource Center (Friday, 3:45-5:15 p.m.)  
Moderator: *Thomas Kosnick, Researcher, Stanford Business School;*  
Panelist: *Alan Gross, Director of Systems, International Paper Company*

The Role of Apple and IBM in Corporate Computing (Friday, 3:45-5:00 p.m.)  
Moderator: *David Bunnell, Publisher, "PC World"*

New Issues of Confidentiality and Security in Organizational Information Processing (Friday, 9:00-10:00 a.m.)

Professor *Alan F. Westin, Columbia University*

Personal Computer Acquisition and Implementation Strategies (Friday, 10:00-11:00 a.m.)

*Don L. Eddy, Principal, Office Futures Now, Inc.*

Compatible Systems and Software for the IBM PC (Friday, 2:00-3:30 p.m.)

Moderator: *Steve Cook, Technical Editor, "PC World"*

Panelists: *Chris Larson, Product Marketing Manager, MS/DOS; MicroSoft; Steve Flannigan, VP Software, Compaq Computer Corp.*

### 2. Introduction to Microcomputing and its Applications

For Executives who are concerned with the selection and use of microcomputers primarily in smaller businesses, the EMCE conference highlights:

Keynote: The Personal Computer: The Mouse that Roared! (Thurs., 9:00-10:00 a.m.)

*Lee Kornfeld, Director, Tandy Corporation*

How to Buy a Personal Computer (Thurs., 10:00-11:00 a.m.)  
*Lawrence Goveoni, Director, Goveoni Microcomputer Training School, Boston, MA*

Spread Sheet/Financial Applications (Thurs., 2:00-3:30 p.m.)  
Moderator: *Hannah Blank, Vice President-MIS, Chase Manhattan Bank*

Panelists: *Sheryl Kelkar, Mktg. Mgr., Standalone Products, VisiCorp; Russell Warner, Product Mktg. Mgr., End user Products, MicroSoft*

New and Future Trends in Personal Computing (Thurs., 3:45-5:00 p.m.)

*John C. Dvorak, Editor, "InfoWorld"*

Word Processing Packages for Personal Computers (Friday, 9:00-10:00 a.m.)

*Susan Harnum, President, Transitions*

DBMS on Personal Computers (Friday, 10:00-11:00 a.m.)

*Adam Green, President, SoftwareBanc*

A Look at Integrated Software Packages (Friday, 2:00-3:30 p.m.)

Moderator: *Dan Coarsey, Sr. Market Analyst, International Data Corporation*

Panelists: *Chris Morgan, VP, Communications, Lotus Development Corp.; Brian Fischer, Sr. Vice President, Context Management Corp.; Roy Folk, OEM Customer Mktg. Mgr., VisiCorp*

Panel: Executive Personal Computer Success (Friday, 3:45-5:15 p.m.)

Moderator: *Alan Snider, Partner, Larcuth & Horvath*

### 3. Technological Developments in Personal Computing

For Executives who wish to keep up with changing microcomputer technologies in mass storage, business graphics, operating systems, and more, the EMCE conference highlights:

Keynote: The Future of Personal Computer Software for Business (Thurs., 9:00-10:00 a.m.)

*Dan Fylstra, Chairman, VisiCorp*

What's New in Peripherals (Thurs., 10:00-11:00 a.m.)

*Peter Burgess, President, Burgess Management Associates*

Developments in Personal Computer Business Graphics (Thurs., 2:00-3:30 p.m.)

Moderator: *Dave Needle, Sr. Writer, "InfoWorld"*

Developments in Mass Storage Capabilities (Thurs., 3:45-5:00 p.m.)

Moderator: *Will Zachmann, VP, Office of Technology Assessment, International Data Corporation*

Utilities (Friday, 10:00-11:00 a.m.)

*Haines Gaffner, President, LINK*

Popular Programming Languages (Friday, 10:00-11:00 a.m.)

*Gordon Eubanks, Vice President, Commercial Systems Division, Digital Research, Inc.*

Operating System Selection: 8 to 16 Bit (Friday, 2:00-3:30 p.m.)

Moderator: *Maggie Canon, Editor-in-Chief, "InfoWorld"*

Panelists: *Gordon Eubanks, VP-Commercial Systems, DRI; Jean Yates, President, Yates Ventures; Mark Ursino, OS Marketing Mgr., Microsoft Inc.; Natalie Shuttleworth, Manager of OS Mktg., Apple Computer*

Developments in Networking (Friday, 3:45-5:15 p.m.)

Moderator: *Will Zachmann, VP, Office of Technology Assessment, International Data Corporation*

Panelists: *Mark Stahlman, Dir., Mktg. Development, General Instrument Corp.; Art Simon, Director of Mktg., Commercial Services, Warner-Ames Cable Communications Inc.*

4. Microcomputer Market Opportunities For Entrepreneurs, Dealers, Distributors and Systems Houses, we'll offer sales and venture capital strategies you won't want to miss. Session highlights include:

Keynote: Retail Opportunities in the Personal Computer Marketplace (Thurs., 9:00-10:00 a.m.)

*James Finke, President, Internetwork, Inc.*

Software Packaging and Distribution (Thurs., 10:00-11:00 a.m.)

*Will L. Edson, Director of Marketing and Retail Communications, MicroPro International*

Raising Venture Capital for Software and R&D (Thurs., 2:00-3:30 p.m.)

Moderator: *Jim Furneaux, Partner, L.F. Rothschild, Unterberg, & Yachin*

Legal Issues for the Retail Distributor (Thurs., 3:45-5:00 p.m.)

*Walter Klasson, Brown, Raysman & Millstein*

Market Update: Competition from Japan (Friday, 10:00-11:00 a.m.)

*Robert C. Wood, President, Robert Chapman Wood Company*

Successful Training Strategies for Vendors and End Users (Friday, 2:00-3:30 p.m.)

*Sue Cornwall, NEC Information Systems; Stephanie Rosenbaum, President, Trc-Ed*

Delivering Good Maintenance, Service & Support (Friday, 3:45-5:15 p.m.)

*John Harnett, Director of Planning and Development, TRW Customer Service Division*

Scaling the Corporate Account: Problems & Pitfalls (Friday, 9:00-10:00 a.m.)

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# S AT COMPUTER SHOWS?

Exposition that's as serious about personal computing as you are.



EMCE gives you a complete conference program and exhibition:

- 48 conference sessions
- 3 days of exhibitions
- Hardware/Software selection
- Micros in smaller businesses
- Financial applications
- Special program of personalized instruction
- Future trends
- And much more!

The Executive Microcomputer Conference and Exposition (EMCE) is sponsored by the Conference Management Group of CW Communications Inc., publishers of *Computerworld*, *InfoWorld*, *ISI WORLD*, and *PC World*.

Computer Funding and Acquisition (9:30-10:30 a.m.)  
Ann Cullather, Education Legislation & Technology,  
Washington, D.C.

Logo: An Educational Language (10:45-11:45 a.m.)

Richard Carter, Director, Educational Laboratories, Lesley College  
Teacher Training (1:15-2:15 p.m.)

Kevin Dwyer, Training Director, Unicom

Administrative Applications for Educational Institutions (2:15-3:15 p.m.)

Patricia Carter, Computer Applications Specialist, MASBO Co/Op  
Educational Computing at Home (3:30-5:00 p.m.)

Moderator: Scott Mace, Sr. Editor, "InfoWorld"

Panelists: Ken Komoshi, Executive Director, Educational Products  
Information Exchange Institute; Richard Robinson, President,  
Scholastic Inc.

## Special Hands-On Workshop

Thursday, June 23 & Friday, June 24

In addition to the main conference program, EMCE will offer a two-day **Executive Microcomputer Workshop** for those professionals who wish to get hands-on experience with an Apple or IBM Personal Computer. The workshop will focus on four specific applications: spreadsheet analysis using VISICALC, data base management using dBase II, graphics and communications. An in-class network will be set up to demonstrate the communications capabilities of personal computers. The two-day seminar will run concurrently with the EMCE Conference program and will include admission to the exhibits and special feature sessions on Saturday, June 25.

The Executive Microcomputer Workshop will be sponsored by the **Personal Computer Learning Center of New York City** and will be held at the Center, located at 1120 Avenue of the Americas, on Thursday and Friday June 23 & 24th. **Enrollment is limited**, so please register early with your choice of hands-on using either an Apple or an IBM PC.

## FREE Feature Sessions for All Saturday Attendees

**FREE Special Feature Sessions** for all Saturday EMCE attendees (exhibit or conference) will be held Saturday, June 25 from 9:00-1:00 p.m. The sessions will focus on professional applications for micros and starting your own home based business or office, and will also discuss the personal computer's impact on family life, kids and recreation.

### 1. The Home Office — Basics

Getting Started — Hardware & Where to Buy (9:00-10:00 a.m.)  
Daniel P. Coursey, Senior Market Analyst, International Data Corp.

Software Applications — Selection & Uses (10:00-11:00 a.m.)  
David Lamb, Sr. Research Associate, LINK

Setup & The First Six Months (11:00 a.m.-12:00 noon)  
Paul Conover, President, Praxsys Communications

Programming Languages (12:00 noon-1:00 p.m.)  
A. Richard Miller, Partner, Miller Microcomputer Services

### 2. Professional Applications

A Look at Spread Sheet Applications (9:00-10:00 a.m.)

Ralph Wagner, President, Microsource/Financial, Inc.

Investment Management Applications for Micro's (10:00-11:00 a.m.)

Jon Zonderman, Contributing Editor, "Computer Update"

On-line Data Base Systems (11:00 a.m.-12:00 noon)

Steven Sieck, Dir., Electronic Information Program, LINK

Word Processing Packages for Microcomputers (12:00 noon-1:00 p.m.)

Ronnie Marshak, Contributing Editor, "The Seybold Report"

### 3. Home/Family Microworld

Household Management (9:00-10:00 a.m.)

Micros for Organizations & Groups (10:00-11:00 a.m.)

Home Micro-Based Businesses (11:00 a.m.-12:00 noon)

A. Richard Miller, Partner, Miller Microcomputer Services

Micros: Impact on Family Life, Kids & Recreation (12:00 noon-1:00 p.m.)

Dan Oehlson, Executive Producer, Children's Computer Workshop

## Over 100 Professional Exhibits at EMCE

EMCE exhibits offer the latest in business-oriented hardware, software, peripherals, systems, accessories and resources from a wide selection of suppliers including companies like IBM, Digital Equipment Corporation, BASF Systems Corp., Computerland, Addison Wesley, GRID Systems, Micro Systems International, Key Software and Victor Electronics . . . to name just a few. EMCE's designed for you to see, touch and learn what you need to know about micros. **Your conference registration includes complete, 3-day exposition attendance.** Or you can sign up for the exhibits only. If you register in advance, using the form in this ad, you get two bonuses:

1. **Early admission** — only conference registrants and advanced registrants will be admitted to the hall between 11 a.m. and NOON on Thursday and Friday.
2. **\$5.00 discount** on admission price.

Register for EMCE now! The Sheraton Centre in New York City is the place; June 23-25, 1983 are the dates. Exposition hours: 11-7, Thursday and Friday; 10-6, Saturday. For more information on the conference and exposition, dial 1-800-225-4698 (In Massachusetts, 617-879-0700) and ask for Louise Myerow.

**EMCE™**  
Executive Microcomputer  
Conference & Exposition

## Conference Registration

Includes Complete Exhibit Admission with 11:00 a.m. early admission privilege

- ☐ Full Two-Day Conference Registration\* \$295
- ☐ One Day Conference Registration \$195
- ☐ Thurs. only ☐ Friday only
- ☐ Executive Microcomputer Workshop\* \$595
- ☐ Thurs. and Friday
- Choose one: ☐ Apple ☐ IBM PC
- ☐ Micros in Education \$ 95
- Sat. June 25

\*Includes Saturday Special Features Programs

Conference registrants only may register by phone. Call 800-225-4698. In Mass. call collect 617-879-0700 and ask for Louise Myerow.

Registrations Cancelled later than June 15 are subject to a \$50.00 service charge. Registration may be transferred at no charge.

EMCE — Sheraton Centre, New York City June 23-25, 1983

- ☐ YES: Register me for EMCE (fill out attached conference form)
- ☐ YES: Register me for EMCE Exhibit Only (fill out attached exhibit form)
- ☐ Send Information Only.

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Exp. date \_\_\_\_\_ Acct. # \_\_\_\_\_

Signature \_\_\_\_\_

Send Form and Payment to: EMCE, Conference Management Group, Box 880, Framingham, MA 01701.

## Exhibit Only Registration

SAVE \$5 by Registering in Advance and Get Early Admission. (Only Advance registrants will be allowed into show between 11:00 a.m. and NOON on Thursday and Friday)

- ☐ Advance Pre-Paid 3 day exhibit registration \$20 (\$25 at door)
- ☐ Advance Pre-Paid 1 day exhibit registration \$10 (\$15 at door)
- ☐ Thurs. ☐ Friday ☐ Saturday

3-Day Exhibit Registration Includes Special Feature Sessions on Saturday, June 25th from 9:00 a.m. to 1:00 p.m.

You must enclose your check or charge information. We cannot bill you or take your exhibit registration over the phone. Exhibit registration is non-refundable.

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Where you'll find the world's leading manufacturers and suppliers as well as the up-and-coming stars. More than 1200 exhibitors in 5000 booths.

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# TOPS-20. NOW A NEW

Introducing loosely-coupled multiprocessing with DECSYSTEM-20.™ A unique way to link mainframes for power, free all peripherals from hosts, and share resources among all users.

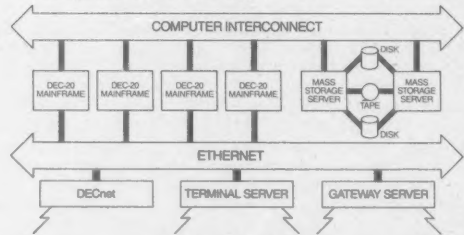
A compatible new version of TOPS-20™ operating system makes it possible.

Version 6 distributes operating system responsibilities among independent computing, mass storage and communications servers. These servers, processing work in parallel, allow system designers to build an open-ended multiprocessing network. The first network that performs like a single multiprocessing system.

Here's the inside story: Our new intelligent mass storage server is connected to as

many as four DECSYSTEM-20's over a high-speed hardware bus. An extension to TOPS-20, the Common File System, gives each host equal access to all system files. The mass storage server off-loads the hosts of all physical I/O management tasks. This makes the server's disk and tape subsystem simultaneously and transparently available to all users regardless of which host executes the request.

Here's how it looks:



# WAY TO EXTEND THE LINE.

A future extension of TOPS-20 will off-load each host of communications tasks. These will be performed by outlying intelligent communications servers on Ethernet. This will allow terminals on foreign networks, remote DECnet™ networks and other local area networks transparent access to your system. Again, independently of hosts.

With the new TOPS-20, the possibilities for system design become almost endless. You get freedom of information. You can create a virtual common file system using any number of disks. You get freedom of communications. You can link up with other networks regardless of their physical location, size, and protocols.

Most importantly, you can independently add and subtract dedicated computing, mass

storage and communications resources to meet your changing requirements.

TOPS-20 Version 6. It provides the most flexible form of distributed processing ever because it's got what distributed processing has always needed most.

An operating system that makes it all hang together.

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100 Nagog Park, Acton, MA 01720 USA.

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## Rolm Enhances Net With Five Units

(Continued from Page 71) containing a video display and detachable keyboard. The lectern can store between 10,000 and 150,000 call details depending on disk size, a vendor spokesman said. It allows callers to dial long-distance calls directly, to calculate the cost of each outgoing voice or data call and to price each outside connection according to predetermined formulas.

First deliveries of the Resale Manager system are due to begin in September with prices beginning at \$18,900.

The ACD 9000 system is designed as an update of the company's current ACD product line to include large systems users of its computerized branch exchange (CBX) network. It can reportedly accommodate between 1,200 and 10,000 voice and data extensions.

The ACD 9000 contains a digital telephone equipped with a two-line LCD and can be designed to distribute automatically incoming calls equally to customer service agents through a variety of routing options, a vendor spokesman said. The system is priced at \$36,000.

The Rolmphone 400 device includes an optional Datacom Module that acts as a communications interface

for terminals and personal computers. Its purpose is to give users access to local and remote computer resources through the Rolm CBX at 19.2K bit/sec for asynchronous data and 64K bit/sec for synchronous data. The product is priced at \$600, and shipments are due to begin this fall.

Rolm is located at 4900 Old Ironside Drive, Santa Clara, Calif. 95050.

## Band Printers Introduced

NEW YORK — Centronics Data Computer Corp. has announced a line of fully formed character band printers in the 300 to 500 line/min range.

Linewriter 400 is said to offer a full range of print bands, including statistical bands in 48-, 64-, 96- and 128-char. sets. A selectable, compressed pitch capability is also available.

The printer is available for \$5,000 from Centronics Data Computer Corp., One Wall St., Hudson, N.H. 03051.

## Organization Important, Panel Says

(Continued from Page 71)

In their study, "Advanced Office Systems: An Empirical Look at Use and Satisfaction," Gutek and Bikson reported on the influence of office automation implementation in varied office settings. Twenty-six organizations were examined — half in manufacturing and half in service industries — for a total of 530 employees. "We found that while performance standards went up with the introduction of technology, pay levels had not changed accordingly," Gutek reported.

"We found resistance only in anticipation," Bikson said. "Once the system is there, people go with it."

The best system support was discovered to be in secretarial and clerical applications, she said. The professional/technical staff had less support. Top management/administration had the least, "because their work includes the most varied tasks."

The least satisfied with the system were data-oriented workers, while the most satisfied were text-oriented workers — people who write reports — because the equipment made their jobs easier.

## Abuser Friendly Report Processor For IBM/38?

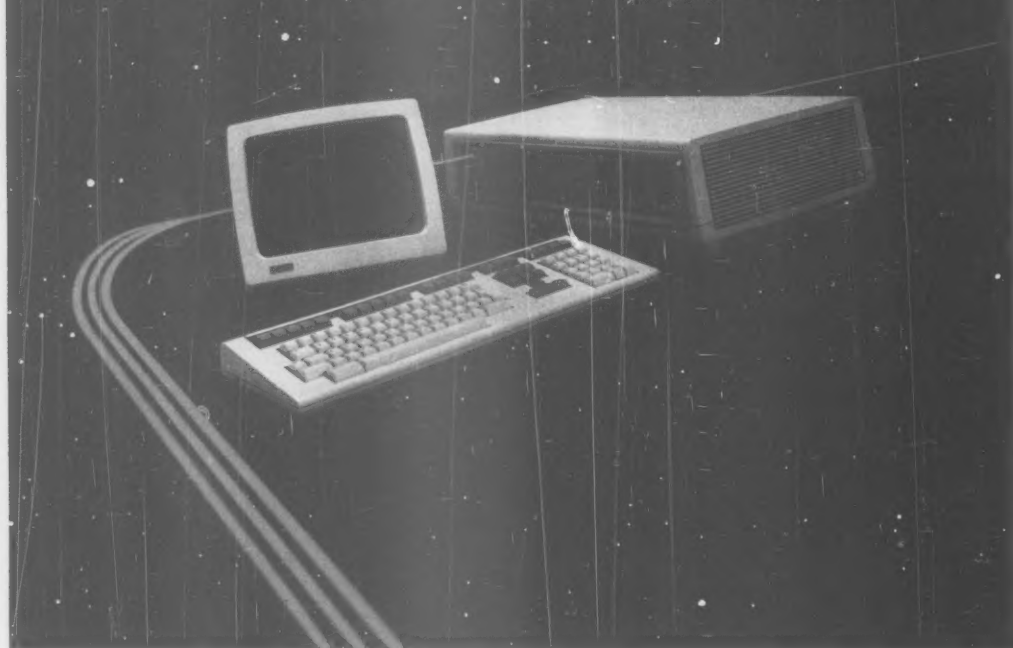
Managerial support software that is truly easy to use.

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### Writing software for the DEC PC? Try Whitesmiths' new compilers and Idris (UNIX-like) operating system.

Based upon our time-tested RSX-11M C Compiler, the new C Compiler has been augmented with a system library tailored to P/OS, plus additional library functions to aid migration of programs from UNIX to P/OS.

In other words, you can develop programs for P/OS under RSX or VMS, test them in the host environment, then down-load them to a CT-350 to produce applications diskettes. And you can also call all DEC Professional library routines from C programs.

Need more? Efficiency. The compiler is designed to operate with the DEC

software toolkit on RSX-11M, RSX-11M Plus, and VAX VMS/AME. Output is MACRO 11 code, so that C code may be intermixed with assembler and linked with the standard task builders TKB or PAB. An extensive subroutine library is also provided for use with C.

Pascal. Use our equally time-honored Pascal translator to compile your Pascal applications. We support separate compilation so you can intermix Pascal, C, and assembler, for even greater flexibility.

Idris. Our multi-user, multi-tasking operating system gives you everything you need to develop and run applications on the DEC PC, with all of the advantages of a UNIX environment.

Portability. It's the same C, Pascal, and Idris we support on all variants of PDP-11, VAX, 8080, 8086, and MC68000.

Affordability. RSX-11M C is only \$1100 (including shipping, manuals, and installation kit). Pascal plus C for RSX-11M is \$1400. Idris costs \$1100 with C, \$1250 with both C and Pascal. We offer substantial OEM discounts.

Availability. Now.

After considering all of this, you will find there is only one decision to be made: C for yourself.



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## SIA Report Indicates Strong Sales For Semiconductor Industry in 1983

By Robert Batt

CW West Coast Bureau

CUPERTINO, Calif. — Further evidence that chip manufacturers are quickly pulling out of a long slump came last month with the publication of the latest industry forecast from the Semiconductor Industry Association (SIA).

After three years of slow growth, shipments of semiconductors by U.S. and European-based firms are expected to increase 13% to \$10.6 billion this year, according to the SIA figures.

The report, recently published by the Semiconductor Trade Statistics Program Committee on behalf of SIA, also forecast that the industry will grow by almost 40% over the next two years to reach shipments valued at \$15.2 billion in 1985.

According to the report, "Semiconductor Forecast 1983-1985," growth this

year will be concentrated mainly in the sales of integrated circuits, which are expected to increase from a 1982 total of \$6.9 billion to \$8.0 billion by year-end.

The report also predicted that sales of integrated circuits will continue to rise, reaching \$9.8 billion in 1984 and \$12.2 billion the following year, a cumulative rise of 46% over the current year. In contrast, sales of discrete circuits are expected to reach \$2.6 billion in 1983 and grow by only 6% a year through 1985.

"The growth of the integrated circuit market will continue to outpace that for discrete devices. By 1985, discrete devices will represent less than 20% of total worldwide semiconductor shipment dollars," Tom Hinkelman, executive director of SIA, said.

Among the integrated circuit product families showing the greatest

(Continued on Page 76)

## Some Vendors Still Hot; Others Cooling After NCC

By Jeffery Beeler

CW West Coast Bureau

BEVERLY HILLS, Calif. — Organizers of this year's National Computer Conference are unlikely to reach an out-of-court settlement with a group of irate vendors that had the misfortune of occupying the show's oppressively hot Pavilion exhibits.

That prediction comes from Los Angeles area attorney Michael Dempsey, who represents about 80 NCC '83 exhibitors threatening to sue conference organizers over conditions in the makeshift exhibit area.

If efforts to reach a settlement fall flat, the exhibitors will likely respond with a class action lawsuit against NCC's main sponsor, the American Federation of Information Processing Societies, Inc. (Afips), Dempsey said.

### Two Factions Emerge

At least one group of unhappy Pavilion exhibitors is already clamoring for prompt legal action against Afips. But another group is urging its members to postpone a decision on the lawsuit question until they have given Afips a fair chance to respond to the vendors' complaints and make appropriate amends.

That response is expected to be contained in a status report that show organizers have promised to make available no later than 30 days after NCC's May 19 conclusion. Until the report has been released and reviewed, members of the wait-and-see group will continue to negotiate with Afips in an effort to avert an all-out legal showdown, Dempsey said.

For now at least, the more moderate of the two exhibitor factions appears to have gained the upper hand. Even vendors favoring immediate legal action seem unlikely to sue Afips until the organization has issued its status report, the attorney said during a May 25 phone interview.

"Enough of the exhibitors seem to want to wait for 30 days that the rest of the companies would be unwise to file a suit without them," he said.

Dempsey voiced serious doubts that

(Continued on Page 76)

## VM Software's Chief Paints An Optimistic Product Future

By Lois Paul

CW Staff

ANAHEIM, Calif. — "You put all your eggs in one basket and then you watch the basket."

With these words of Mark Twain, Bob Cook, president of VM Software, Inc. of Falls Church, Va., described the philosophy for his firm. Cook voiced his opinions during an interview at the recent National Computer Conference here, where he was gauging interest in certain potential product areas and seeing if the show would be a good site for VM Software.

However, he maintained, "We are not looking to do anything other than VM utilities."

VM Software was formed in 1980 to develop and market packaged system software utilities to users of IBM's VM operating system environment. Its first product was VMbackup, released in 1981. Since then, eight additional integrated products have been introduced.

According to Cook, the firm has only one serious competitor to VMbackup,

(Continued on Page 82)



CW Photo by S. Blakemore

Bob Cook

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COMPUTER INDUSTRY

# Lawyer Says Out-of-Court Settlement Unlikely

(Continued from Page 75)

Afips' promised report will recommend any major restitution for the Pavilion exhibitors.

"In the end, all I think we're going to get from the show organizers is a letter explaining what happened [in the Pavilion exhibits] but offering no money," Dempsey said.

"My guess — and this is my lawyer's cynicism coming through — is that the organizers will try to delay, to string things out, as much as they can," he added.

"They probably figure that the longer they make exhibitors wait, the greater the chances that they will simply forget about the whole matter and write off their losses. That's certainly what I would tell the organizers if I were their attorney," he maintained.

## Could Sue Together

If Dempsey proves correct in his forecast that Afips will offer the Pavilion exhibitors little or no financial compensation, many of the vendors will probably make good on their threat to band together and sue for damages.

"The exhibitors spent so much money to rent floor space and set up their exhibits that, I think, many of them would be quite willing to proceed with a suit," Dempsey said. "The cost to them was enormous."

Dempsey's sentiments were echoed by Alan Davis, Molecular Computer, Inc.'s vice-president of marketing. "We're seriously considering joining the class action lawsuit," Davis said during an NCC interview.

"We paid \$50,000, excluding salaries for our exhibit personnel, to attend this show only to have visitors to our booth walk out right in the middle of presentations because they couldn't stand the heat."

Davis' firm was said to be one of 277 vendors to occupy the Pavilion exhibit facility during NCC '83's four-day run beginning on May 16. In essence, the makeshift exhibit hall consisted of six connected tents that housed the exhibitor overflow from the Anaheim Convention Center, site of NCC's main show floor.

## Transformed Into Hothouses

The tents, pitched in the convention center's parking lot, were supposed to have been kept reasonably comfortable with air-conditioning units powered by three on-site generators.

But the generators apparently failed, and the tents were quickly transformed into hothouses.

One exhibitor, U.S. Design Corp. Director Steve Blum, obtained a thermometer and measured the May 18 temperature inside the Pavilion at 113°F.

The combination of withering heat and poor ventilation resulted in widespread hardware failures and took a heavy toll on exhibit personnel.

"We had one employee in our booth who had to be flown back home early because of the heat," Davis said.

vis said.

The sauna-like conditions were also widely blamed for what many Pavilion exhibitors described as a disappointingly low attendee turnout — a problem that apparently worsened as word of the intense heat spread throughout the main show floor.

By May 18, many exhibitors in the sweltering Pavilion had exhausted their patience and were demanding action.

The exhibitors quickly broke into at least two main factions, one of which met with Afips representatives during NCC and convinced them to remedy the heat problem and issue the status report by mid-June.

## SIA Forecasts 13% Sales Jump

(Continued on Page 75)

growth will be digital complementary metal oxide silicon (Cmos) and digital metal oxide silicon (Dmos) logic, with both experiencing growth rates between 26% and 31% per year through 1985, the report said. The Dmos memory market is also expected to do well, increasing from sales of \$1.9 billion this year to \$3.1 billion in 1985.

During the next three years, Hinkelmann added, demand for integrated circuit devices will be fueled by the digital Cmos sector, which will have growth rates in excess of 25% through 1985.

In marked contrast to the past two years, semiconductor shipments to all geographic areas will surpass 10% growth in the current year, the SIA report said. The U.S. market will grow 14% to \$6.4 billion in 1983, 19% to \$7.6 billion in 1984 and 21% to \$9.2 billion in 1985, the report said.

In Western Europe, the semiconductor market is expected to increase 11% this year, exceeding sales of \$3 billion. Western Europe should experience growth rates of 35% over the next two years, topping \$4.3 billion in 1985, the report said. West Germany and the UK are expected to be the two strongest countries for semiconductor sales.

"Semiconductor Forecast 1983-1985" is available for \$100 from SIA, Suite 155, 20380 Town Center Lane, Cupertino, Calif. 95014.

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## Fujitsu, Matsushita Join Forces To Design, Develop Software

OSAKA, Japan — Fujitsu Ltd. and Matsushita Electric Industrial Co. have formed a company to design and develop jointly computer systems and software.

MF Information Systems Co. was officially established June 1, and full operations are expected to start in August. Each company is contributing 50% to the \$1.3 million venture.

Based here and employing 70 people initially, the joint venture will work to develop software, hardware interfaces and new computer systems. The firm will also conduct surveys in research and development and marketing, ac-

cording to Don Spetner, a spokesman for Matsushita.

The formation of the new company marks a return to the fold for Matsushita, which withdrew from the general computer market in 1964. Currently one of the world's largest consumer electronics companies and primarily a manufacturer of video equipment, Matsushita is gradually moving into the office automation equipment marketplace, Spetner said, as well as into robotics systems.

Matsushita President Toshihiko Yamashita is president of the new venture, and Fujitsu Chairman Taiyu Kobayashi is its chairman.

## Inman Designates Austin As Site for MCC Home Base

AUSTIN, Texas — Bobby Inman, president of the Microelectronics and Computer Technology Corp. (MCC), the research and development consortium of 12 technology companies, has selected Austin as its home base.

In making the announcement, Inman said he plans to set up an office here by June 15 and begin searching for management personnel immediately. A basic management force is expected to be in place by August, and laboratory research is slated to begin by the end of the year.

While he declined to offer specific details about the Austin site, Inman said MCC will take over an existing

office building and eventually use about 200,000 square feet of floor space in Austin. In all, MCC is expected to employ about 500 people.

Austin was selected from a list of more than 57 cities in 27 states, each of which submitted proposals to MCC. Inman is a Texas native and a graduate of the University of Texas.

## Xerox, Visicorp, 3Com to Link IBM Micro to Net

ANAHEIM, Calif. — Xerox Corp., Visicorp and 3Com Corp. have announced plans for a joint project to allow users of IBM Personal Computers equipped with Visicorp's Vision software to have direct access to services on Xerox's Ethernet local-area network.

These network services — electronic printing, filing and mailing — are currently shared by professional workstations, word processors and personal computers on the network.

According to the agreement, Xerox will develop network applications for the Vision system, making Ethernet services accessible. Visicorp will market these Ethernet applications worldwide to run with Vision on the IBM Personal Computer and 3Com will provide the direct hardware and protocol software connection to the Ethernet network.

Xerox will also work with Visicorp to implement a Vision system on a Xerox personal computer, either the A20-1 or A20-2.

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## Mergers & Acquisitions

**National Computer Systems, Inc.**, Minneapolis, has acquired **CompuPsych**, a Kansas City, Mo., manufacturer of specialized microcomputer-based testing systems.

\*\*\*

**The First National Bank of Chicago** has purchased **Comtrac, Inc.** of Columbus, Ohio. Comtrac provides transformation information services and products.

\*\*\*

**Bishop Graphics, Inc.**, Westlake Village, Calif., has acquired **Computer Aided Design Resources, Inc.** of Pasadena, Calif.

\*\*\*

**Comtech Telecommunications Corp.** has signed an agreement in principle to acquire the operating assets of **Storage Technology Corp.**'s subsidiary, **STC Communications Corp.** for approximately \$9 million in cash and notes and five-year warrants to acquire 450,000 shares of Comtech common stock at \$12 per share.

\*\*\*

**Data Printer Corp.**, a privately owned Mass. company, has become a subsidiary of **Printronic, Inc.**, Irvine, Calif., in exchange for 210,000 shares of Printronic common stock.

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## Supershots

**Convergent Technologies, Inc.** has entered into a multiyear OEM agreement to sell its computer systems to **Gould, Inc.'s** Distributed Systems Unit and other U.S. subsidiaries of Gould.

**Darattech, Inc.** has published a directory containing information on 60 computer-aided design and manufacturing (CAD/CAM) vendors and 125 systems. "CAD/CAM Computer Graphics: 1983 Survey and Buyers Guide" can be obtained through P.O. Box 410, Cambridge, Mass. 02238.

**RCA's** new Component and Display Division will develop a line of standard and custom video monitors for consumer and industrial use. RCA's Picture Tube Division will be absorbed by the new division.

**Datamedia Corp.** has created four independent profit centers, each with complete operations management and sales responsibility. Company President Guy Daniello, formerly vice-president of software products, will continue to direct software operations. Heading up the other profit centers are: Leonard J. Accardi, vice-president, computer systems; Jake Powell, vice-president, display products; and Frank Zelis, vice-president, marketing and customer services.

**Spectra Services** has introduced a new service, **It Circles-Retail**, which for an annual fee provides member companies with a data base covering new technology systems and services; an information search service; a "phone-in" advice service on system design, selection and implementation; and a program of seminars and workshops.

**Centec Corp.**, Reston, Va., and **Genigraphics Corp.** of Syracuse, N.Y., have signed a long-term marketing and technical development agreement. The first phase of the agreement will interface the Centec Cheetah software system operating on the IBM Personal Computer with the Genigraphics high-resolution film recorder.

**Prime Computer, Inc.** has signed a contract with **Ford Motor Co.** to market the Product Design and Graphics System, a three-dimensional wire design and drafting system originally developed by Ford for curved or free-form surfaces and used by the company for the past 10 years in automobile bodies. The system has been generalized to be applicable to structures, mechanical components and systems.

**Commodore International Ltd.** has formed the Commodore Software Division and has named **Sigmund Hartmann**, formerly of TRW, Inc., as division president.

The Computer Science Department of **Brandeis University** has received \$4 million from **Mark Michom**, former executive with the Ideal Toy Co. The gift, which extends over a period of years, will be used for a Michom Chair in computer science and for expansion of the department.

The seventh edition of the "Guide to Venture Capital Sources" has been published by **Capital Publishing Corp.**, 2 Laurel Ave., Wellesley, Mass. 02181. The 450-page guide lists more than 500 active U.S. and Canadian venture capital firms and includes 27 articles on various aspects of venture capital financing.

**Syracuse University's** School of Computer and Information Science has received an IBM departmental grant of \$25,000 for outstanding competence in the area of logic programming, a branch of artificial intelligence that enables computers to reason deductively and solve symbolic problems.

**Keane, Inc.** of Boston has donated its new factory information system, **Impon**, to Boston's **Channel 2 Auction**. Auction manager Edythe C. Baker called the gift, valued at \$75,000, the single most valuable donation ever made in the 18-year history of the auction.

**Gould, Inc.** has formed the Micro Power Products Division, which will design, develop and manufacture miniature power products for electronics applications.

**Digital Equipment Corp.** has donated a DEC 11/44 general-purpose minicomputer valued at \$60,000 to the Management Information Systems (MIS) Department of the **University of Arizona**. The award is part of a continuing program of corporate contributions to the university that started in January 1981 with the award of \$130,000 toward the purchase of a DEC VAX 11/780 for the MIS department.

**Prime Computer, Inc.** has donated a Prime 850 computer with six workstations and a Medusa software system, valued at more than \$800,000, to the **University of Virginia's** School of Engineering and Applied Science.

**American Express International Banking Corp.** will participate with **Anacom, Inc.** in the development and implementation of three banking software applications — global customer liability, documentary credits and collection and global funds trading/treasury.

**Computer Systems Engineering, Inc.** has been awarded damages of \$2.3 million for breach of contract and misrepresentation and punitive damages of \$15 million in its suit against **Mohawk Data Sciences Corp.'s** subsidiary, **MDS Qantel, Inc.** The action, based on an alleged wrongful termination of a distributorship agreement, was brought in 1979 against Qantel Corp., which was acquired by Mohawk Data Sciences in 1980.

**Oracle Corp.** has formed an applications products group that will provide microcomputer versions of the Oracle relational data base management systems to software OEMs, systems houses and others developing applications for end users.

# Senate Begins Hearings on Copyrights for Chips

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The long-running debate over extending copyrights to semiconductor designs entered a new phase recently when the U.S. Senate began hearings on computer chip protection legislation.

Testimony at hearings held last month by the Senate Judiciary Subcommittee on Patents, Copyrights and Trademarks showed that the recently proposed Semiconductor Chip Protection Act of 1983 has not resolved the controversy over whether copyrights are the best vehicle for curbing chip design piracy.

The proposed law would grant 10-year copyrights for semiconductor masks, while allowing standard reverse engineering practices. It would mandate a compulsory license for innocent copyright infringers who would not be liable for use or distribution of copyrighted chips before receiving notice their actions were illegal.

## Difference of Opinion

Industry representatives told the subcommittee they support some form of protection for chip designs, but were split over whether a copyright is the best or most appropriate form of protection. They were also divided over whether the currently proposed Senate bill and its companion House measure would adequately protect users' communities.

Speaking for the Semiconductor Industry Association, F. Thomas Dunlap Jr., corporate counsel and secretary of Intel Corp., said the association has decided a copyright "is the only practical method of protecting our valuable patterns." He noted, however, that semiconductor "mask works" may not correspond to products traditionally afforded copyright protection.

Citing that change in usual copyright subject matter, several witnesses suggested alternative forms of chip protection, including patents and copyrights issued under separate legislation rather than through amendments to current copyright statutes, as proposed by the bills now under consideration.

Dorothy Schrader, associate registrar of copyrights for legal affairs and general counsel of the Copyright Office, said her agency "supports the principle of protection for original semiconductor chips and masks." The office is, however, not certain that the proposed bill is the best answer to this need for protection.

Jon A. Baumgarten, copyright counsel of the Association of American Publishers, told the subcommittee that although the association's concern is not for "ideologically pure" copyright law, "the bill might

distort current copyright principles with "untoward and unintended consequences." Baumgarten suggested the proposed law could cause problems in the future when data bases and full books are contained in single computer chips.

Harvard Law School Prof. Arthur R. Miller, however, dismissed those concerns, saying copyright protection may not be perfect but is wholly proper. "The work product of the American semiconductor industry needs protection now," he said. Miller is a member of the former National Commission on New Technological Uses of Copyrighted Works.

Noting it has taken four years to develop the current legislative proposals, "further delay of that magni-


tude to develop a new form of protection could well be disastrous," Miller said. "Furthermore, nothing is to be gained by pursuing such an avenue. The copyright act," he said, "provides an entirely appropriate vehicle for mask works."

Computer industry spokesmen approached the legislation less philosophically. Jack Biddle, president of the Computer and Communications Industry Association, said his group supports the copyright bill, but would like to see it amended so that it will not "inadvertently impair the existing rights of third parties to produce functionally equivalent chips through the design of alternative masks of their own creation."

Biddle suggested that in the fu-

ture, dominant systems vendors who use proprietary chip designs could refuse to sell or license the designs, thus making it impossible for other vendors to offer products to interconnect with those of the larger suppliers. This would severely limit market participation, he said.

Appearing for the Association of Data Processing Service Organizations, Inc., Oscar Schachter, president of Advanced Computer Techniques Corp., said the association does not believe the legislation is the best means to provide semiconductor protection. His primary objection was that because chips do not fall under traditional copyright categories, the bill could complicate issues of protection and fair use.



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# Apple to Donate Micros to 9,250 Calif. Schools

By Robert Batt

CW West Coast Bureau  
ANAHEIM, Calif.—Apple Computer, Inc. has launched a program to donate personal computer systems to more than 9,000 public and private schools throughout California, the company announced at the recent National Computer Conference.

The program, called Kids Can't Wait, is estimated to cost about \$21 million and will make Apple IIe computer systems and supporting software available to 9,250 elementary and secondary schools throughout the state.

Kids Can't Wait follows the passage of legislation by the state legislature last September, making donations of computer equipment eligible for tax credits of up to 25% of its market value. The retail value of the package donated by Apple is \$2,364.

Similar legislation is now awaiting ratification in the U.S. Congress, which would make the more lucrative federal tax credits available to vendors who donate scientific equipment to schools.

More than 140 Apple computer dealers in California are supporting the program by distributing the systems to schools who apply and by training designated teachers in the use of the equipment.

Twenty-eight educational software vendors have also agreed to support the program by donating software or making it available to schools at a discount. These include Harper & Row Publishers, Inc., Science Research Associates, Inc., Xerox Education Publications and The Learning Company.

At the program's launch, Steve Jobs, chairman of Apple, said: "To maintain America's technological leadership, we must begin training students of all grade levels in today's computer technology. If we do not, we risk producing a generation of Americans who will be both noncompetitive and illiterate in the information society now evolving." Putting one computer in

each school won't solve the problem alone, said Jobs, but it will serve as a catalyst to give teachers, parents and students the equipment they need to innovate and learn.

## Available for Students

The Apple program will be available for students up to 12th grade in all California public schools and nonprofit schools with enrollments of 100 or more

students. In addition, all state-certified, nonprofit, private and special education schools qualify.

Each school that applies will receive an Apple IIe with 64K bytes of internal memory, a display monitor, floppy disk drive, manuals and the Apple Logo, a language designed to allow students to learn computer concepts.

The company also intends

to make available supporting printed materials, including the 1983-84 Sterling Swift Educational Software Directory and brochures on computer usage in schools by the International Council for Computers in Education.

To support the training of teachers in computer literacy, Apple is donating five IIe systems to each of the state's 15 teacher education and computer centers.

## Nickels & Dimes

Anacomp, Inc. reported revenues of \$141.2 million for the nine months ending March 31, compared with \$80.3 million for the same period last year. Net income was \$7.6 million or 70 cents per share, up from \$4.2 million or 47 cents per share for the same period last year.

\$\$\$

Recognition Equipment, Inc. reported earnings for the six months ending April 30 of \$7.1 million or \$1.12 per share, compared with a loss of \$13.9 million or \$2.32 per share for the same period last year.

\$\$\$

ISC Systems, Inc. reported revenues of \$20 million for the quarter ending March 24, compared with \$15.9 million for the same period last year.



## Demonstrated at NCC

## Apple Seeks Substantial Bite of Mid-Size Nets

By Bruce Hoard  
CW Staff

ANAHEIM, Calif. — Apple Computer, Inc. is taking a bite out of the local-area network market's new mid-size niche, according to Wayne Rosing, director of engineering for Apple's Personal Office Systems Division.

In an interview here at the recent National Computer

Conference, Rosing discussed current and future aspects of personal computer local-area networks. Until recently, Rosing said, local-area networks have been divided between high-end, high-speed offerings, such as Xerox Corp.'s Ethernet, and slower, low-end systems designed for proprietary products from a single vendor.

He listed Corvus Systems, Inc. as an example of the latter.

Apple last year unveiled Applenet, a local-area network that can link from two to 128 computers. It was designed to fill this mid-size niche which, Rosing said, is comprised of work-area networks. Such networks typically feature 1M bit/sec

transmission speeds and are restricted to departments or single office areas.

Apple showed and demonstrated Applenet for the first time at NCC. The system was running on its Lisa office personal computer.

Apple's director of engineering said that the firm is looking to Ethernet as a standard for local-area networks

and that technical details on Applenet will be made public just as Ethernet specifications were released to the public by its co-developers — Xerox, Digital Equipment Corp. and Intel Corp. The company is also moving to make its products compatible with Ethernet, having commissioned 3Com Corp. for that work.

## Nets Encouraged

Initially, only Apple computers, such as Apple IIe, Apple III and Lisa, will be compatible with Applenet. However, Rosing made it clear he hopes other vendors will develop interface products for other personal computers — most notably, IBM's.

"We hope other vendors will add to the network, too, especially those who will add value," he stated.

Asked to comment on the intrusion of personal computers into the traditional CRT terminal market, he said CRT terminals remain the best tool for large-scale data base operations. However, CRT terminals are threatened by personal computers in such highly interactive applications as word processing, software development and modeling.

The most-mentioned CRT terminal targeted for extinction by the personal computer invasion is IBM's 3270 line. Rosing commented, "I'd be worried if I was in the 3270 division of IBM." He also claimed that the style of a combination CRT terminal and cluster controller is already obsolete, but will live on because of its large installed base.

## Lisa's Importance

Rosing made it clear that Lisa is highly important to Apple's future. Referring to the \$10,000 product, he said, "We have a very large stake in Lisa. We've played 'you bet your company' on it because that's the way Apple likes to do it."

As of May 1, orders for Lisa were double what the company expected for the entire year, he claimed.

He said it is not possible to transmit Lisa graphics to the firm's Apple II, IIe or Apple III machines.

The Xerox 8010 Star workstation has a similar problem transmitting graphics to Xerox 860 personal computers. Rosing said the problem is that Lisa employs a more modern architecture than the Apple IIs and IIIs, meaning it would have to be retrofitted with older technology in order to send graphics to them.

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## Orders & Installations

**Data General Corp.** will install a nationwide integrated office network based on its 32-bit Eclipse processor for E.F. Hutton & Co. The order is valued in excess of \$40 million.

**Megatek Corp.** has been awarded a contract valued in excess of \$50 million to supply graphics terminals to McDonnell Douglas Automation Co.'s Computer-Aided Design and Manufacturing Division.

**NCR Corp.** has received a \$1.5 million order from Citizens Federal Savings and Loan Association for an NCR 5000 branch automation system.

**Wicat Systems, Inc.** has been

awarded a multimillion dollar contract by Apothetech, Inc. for 200 microcomputer systems based on the Motorola, Inc. 68000 processor. Apothetech plans to install a total of 3,000 systems nationwide over the next five years.

**Harris Corp.** has signed distribution agreements with Utelcom, a subsidiary of United Telecommunications, Inc., and Value-Line, a division of Business Telephone Systems, Inc., for its digital switching systems.

**Sperry Corp.** has received an \$18.7 million contract from the U.S. Navy for 18 Sperry 1100/60 computer systems and 22 distributed communications processors.

**Compucorp, Inc.** has received a \$2 million order from the U.S. Department of Justice for 200 information processing systems.

**Sperry Corp.** has received a \$7 million order from Computer Disaster Recovery Corp., Rochelle Park, N.J., for a Sperry 1100/82 system.

**Scientific Systems Services, Inc.** has been awarded a \$13.4 million contract to provide a computer-based monitoring system for Northern States Power Co. in Minneapolis.

**Wang Laboratories, Inc.** has received an order from General Electric Co. valued in excess of \$20 million for office automation equipment.

## Exec Foresees Bright Future

(Continued from Page 75)

which is installed on approximately 435 machines. That is Syncsort, Inc.'s recently announced Syback offering. Cook said his firm essentially got the jump on other companies by recognizing the potential growth of VM sites.

When he was product line manager for both MVS and VM offerings at Boeing Computer Services Co. in the mid-'70s, Cook said he recognized the increasing interest of his customers in interactive systems. With the entrance of companies such as Digital Equipment Corp. and Data General Corp. into this realm, he began watching VM, believing this operating environment had to grow.

Cook speculated that one reason a lot of companies did not rush into the VM marketplace is that they were not getting encouraging numbers of VM installations from industry research houses. These groups had poor VM data bases, he said, because they would call installations and ask them what operating system was running. The answer would be MVS, although they also were running VM on IBM 4300 systems for development alongside their MVS batch systems.

Also, VM was not always promoted by IBM. According to Cook, "VM grew under conditions of adversity. It is one thing to be nurtured and watered and fertilized and grow well. It is another thing to have somebody stomp you back into the ground and still grow."

In the 1975-1976 time frame, IBM tried to destroy VM, he said, because IBM wanted instead to encourage use of its MVS operating system. User pressure kept the system alive until IBM coupled it with its information center concept in 1979, and it has since taken off from there.

One of the benefits of VM is response times about half an order of magnitude better than MVS, Cook said. Users also find CMS (a VM environment) friendlier than IBM's TSO, he added.

"You end up getting more done in the same amount of time," he said. In addition, VM is the only one of IBM's operating systems that has the capability to run multiple other operating systems within it, Cook said.

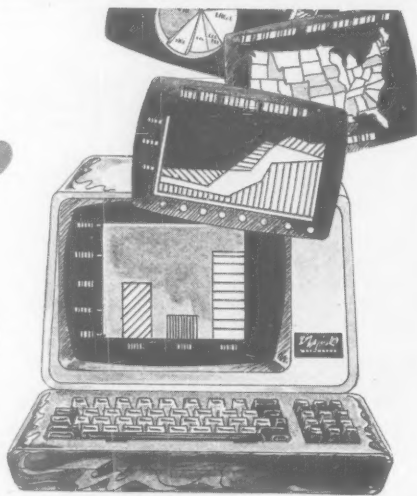
"I think that it will always be strong in the DOS-to-MVS conversion market," he noted.

IBM has introduced a VM/XA (Extended Architecture) product which, Cook said, does not involve drastic changes. His development group has painstakingly avoided modifying the IBM operating systems to facilitate conversions to new versions of VM. He said he is confident the current VM system will be a solid IBM offering for at least the next five years and, more likely, for 10 to 15 years.

Helping this along will be IBM's recent move to provide support for its Structured Query Language under VM. Future directions for VM Software will remain solidly in the VM utility market. However, Cook said the firm will look into the anticipated small-system version of CMS. Along with this, his development group already is exploring micro-mainframe links.

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# Micro-Mainframe Links Draw Crowds at NCC

By Lois Paul  
CW Staff

ANAHEIM, Calif. — Their ventures into the microcomputer arena may prove to be the drawing cards many mainframe software vendors have lacked at hardware-oriented shows, such as the National Computer Conference, if this year's NCC was any indication.

When NCC was held here last month, there was plenty of activity at the booths of those software vendors announcing or showing microcomputer-oriented products

or micro-to-mainframe links. Omnalink, a recently announced micro-to-mainframe linking product, was on display at On-Line Software International, Inc.'s (OLSI) booth. It drew a lot of attendees, according to Carol Molloy, product coordinator for the firm's mainframe-oriented Guardian package.

Alice Kessler, assistant vice-president of promotion for OLSI, said the flurry of activity around the booth has provided the firm with names of new companies to contact. Although she has yet to confirm whether the

leads are qualified customers, Kessler said her "gut instinct" is that the show was a good one for OLSI. She already is making plans to have a bigger booth at next year's NCC.

Ellen Ferri, assistant exhibit coordinator for McCormack & Dodge Corp., said about half of the visitors to her booth were interested primarily in the micro-mainframe links the firm is working on via its Hilite Query System. "I think they just heard about it and are just stopping by to see what it is," she said.

vinced NCC is the right forum for his firm's general offerings, but said, "Maybe this is an early indication of a recognition of the importance of the software part of the house."

About half of the visitors to the Visianswer exhibit were qualified prospects for Informatics' mainframe products, he said. "It was

also interesting that people were pressing us for a lot more information on Answer/DB and were interested in talking about installing that before Visianswer is available."

Answer/DB is the Informatics' product that represents the piece of the micro-mainframe link that resides on the mainframe.

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## User-Friendly Emphasis

Intel Corp. displayed its Data Pipeline hardware/software micro-to-mainframe linking system at its booth, and interest was high, according to product marketing manager Jim Rutledge. Noting that there was a lot of emphasis on user-friendly tools and microcomputer products at NCC, he said, "We have products in the micro world but are keeping the mainframe link alive."

"The anchor for the pipeline is at the mainframe level," he added.

SAS Institute, Inc. received a lot of questions since its announcement of SAS/Graph support for the IBM Personal Computer.

"When are you going to support the IBM Personal Computer?" was what many visitors to its booth wanted to know, according to Patti Sigmon, manager of corporate communications.

Although Informatics General Corp. did not have a booth at the show, representatives for the firm were present at Visianswer's exhibit to promote Visianswer, a product both firms developed jointly to link microcomputers and mainframes.

Merritt M. Lutz, group vice-president of Informatics' software products group, admitted he still is not con-

## Former Intel Exec To Manage Usir

SAN MATEO, Calif. — A former vice-president of Intel Corp. has been named general manager of the newly formed U.S. Data Systems Division of U.S. Instrument Rentals (Usir).

John Taylor will head the \$4 million division, which will assist customers in acquiring data peripherals such as terminals, printers, disk drives and microcomputers either through short-term rental, long-term leases, purchase-option plans or outright purchase.

Taylor has also worked with U.S. Leasing International.

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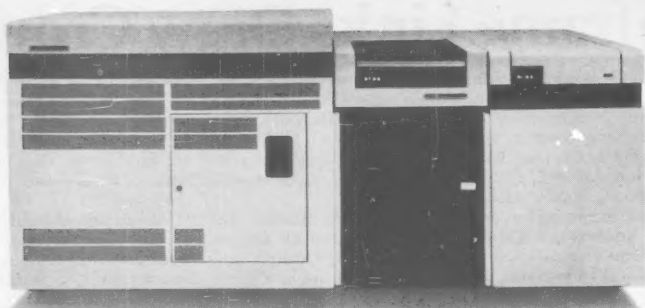
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## Executive Corner

● **W. Paul Warnock** has been appointed vice-president of finance and treasurer for Wicat Systems, Inc.

● **William M. Gibson** has been appointed president and chief executive officer of STSC, Inc.

● **Lars Turndal** has been promoted to president of Memorex International and appointed a vice-president of Burroughs Corp. Memorex Corp. is a subsidiary of Burroughs Corp.

● **Richard J. Tata** has been appointed vice-president of operations at Corona Data Systems, Inc.

● **Jack R. Reynolds** has been named vice-president of marketing for Tandon Corp.

● **Murray H. Bolt** has joined Codex Corp. as vice-president of network control products.

● **Stephen L. Pletcher** has been elected vice-president for marketing and sales at Intersil, Inc.

● **Alex Zakson** has been appointed vice-president for software development of Harris Corp.'s distributed data processing division.

● **Mark L. Seigel** has been ap-

pointed executive vice-president and general manager of Televideo Systems, Inc.'s terminal division.

● **David M. Holland** has been appointed vice-president, sales/systems, for the office and computer products group of Datapoint Corp.

● **James D. Lynch** has been promoted to vice-president of quality assurance and reliability at Advanced Micro Devices, Inc.

● **Douglas G. Pearsal** has been appointed vice-president, finance, at Mohawk Data Sciences Corp.

● **J. Roger Moody** has been named president and chief executive officer of U.S. Satellite Systems, Inc.

● **Richard E. Bennett** and **James V. Lester** have been elected vice-chairmen of ITT. Also elected to new

positions were: **Deroy C. Thomas** and **Daniel P. Weadock**, executive vice-presidents, and **James A. Purdy**, senior vice-president.

● **Patrick B. Brennan** has been promoted to corporate vice-president, treasurer, and **Philip Russell** to corporate vice-president, controller, for National Semiconductor Corp.

● **Joseph V. Charyk** has been elected chairman and chief executive officer and **Irving Goldstein** has been elected president of Communications Satellite Corp.

● **Ronald T. LeMay** has been designated vice-president, external affairs, for the prospective AT&T organization that will provide long-distance and international ser-

vices following the Bell System divestiture.

● **David M. Holland** has been appointed vice-president, sales/systems, for Datapoint Corp.'s office and computer products group.

● **Frederick L. Hanson** and **Dave Friedley** have been named vice-presidents of Tektronix, Inc.

● **Frank F. Castaldi** has been appointed vice-president, finance, in the computer systems operations of Sperry Corp.

● **Lawrence Simon** has been appointed vice-president, corporate development and acquisitions, and **Howard Wohl** has been appointed vice-president and chief financial officer at Monchik-Weber Corp.

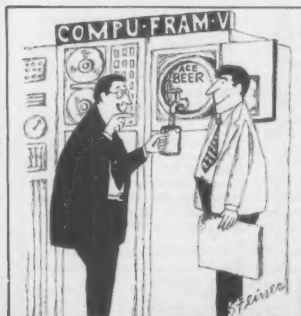
## New Companies

The Scott Fetzer Co. of Cleveland has formed **Novatech**, a firm that will design and manufacture controlled motion systems for the peripherals and robotics markets. The new firm is located at 968 Bradley St., Watertown, N.Y. 13601.

\*\*\*  
**Harvard Software, Inc.** is a new company that will offer second-generation productivity software for IBM and IBM-compatible personal computers. It is located in Harvard, Mass.

\*\*\*  
**The Mega Group** is a new company specializing in the development of microcomputer-style software that will operate on mainframe systems. It is located at Suite 100, 2091 Business Center Drive, Irvine, Calif. 92715.

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**Display Telecommunications Corp.** will design, manufacture and market office workstations that integrate telephones and personal computers. Information can be obtained from the firm at Suite 400, 4100 Spring Valley Road, Dallas, Texas 75234.



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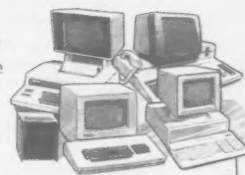
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An opening exists for a VAX System Programmer for the expanding Mini-computer Facility at Auburn University. This position will be responsible for installing, maintaining and tuning the VMS operating system, other system-level software, language compilers and interpreters, and applications packages on multiple VAX 11/750's. This individual will also assume responsibility for the day-to-day management of the facility.

**Qualifications:** Bachelor's degree in appropriate discipline required. Masters degree preferred. Two or more years of systems programming experience on DEC computers with at least one of these years on a VAX machine. Knowledge of VMS internals and assembly programming. Experience in a University environment and knowledge of telecommunications desired.

Auburn University is a state-supported land grant institution and the largest University in the State of Alabama. The institution is a comprehensive research-oriented University with strong areas of concentration in Agriculture-related Sciences, Natural Sciences, all fields of Engineering and other disciplines. The University is located in a small urban community of about 60,000 total residents. Located within the area are excellent recreational and social opportunities.

Send a letter of application and a current resume to:

Bruce Lewis  
Director of Academic  
Computing Services  
Division of University Computing  
144 Parker Hall  
Auburn University, Alabama 36849

Application Deadline: June 24, 1983

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Our division is located on Puget Sound, 25 miles north of Seattle, Washington. Within a

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#### DATA BASE

IDMS P/L Direct sys dev deg ..... \$50M  
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Tenure track position at the rank of Instructor or Assistant Professor of Computer Information Systems. Relevant doctorate preferred; appropriate master's degree considered. Successful teaching experience or demonstrated potential required. Will teach full load of information systems courses from freshman through senior level, advise CIS/DP majors, help sponsor the DPMA Student Chapter, and serve on division and college committees. Qualified candidate may also teach master's-level courses. Undergraduate assignments may include application programming, systems analysis/design, data base and project management.

DPMA curriculum is currently in its second year of implementation, with about 60 undergraduate majors. Master's program in business includes CIS courses. The college's computing environment includes Duquesne Burroughs B1855, DEC PDP 11/45 (UNIX), numerous microcomputers. Current development projects include online distributed processing between Apples and the B1855; implementing UNIX on the B1855. CIS majors receive training on both on-line minis and micro's, and may choose to concentrate on one. The B1855 is the primary teaching machine for CIS.

Applicant should be conversant in at least three of the following languages: BASIC, COBOL, RPG, Fortran. Ability to teach assembly language on Apple II, TRS-80 or IBM PC may be substituted for one of the three. Any extra languages a plus. Industry experience is desired, particularly in Burroughs environment. College was founded in 1911, and is located in scenic northwest Nebraska, only a short drive from Mount Rushmore and the Black Hills. Students and faculty alike enjoy the relaxed and friendly small-town atmosphere of Chadron. Enrollment is approximately 2,000 students. While the CIS program is relatively new at the college, it has long enjoyed a reputation for outstanding programs in education, business and the liberal arts.

Send resume and letters of recommendation to: Dr. Edwin Nelson, President, Chadron State College, Chadron, Nebraska, 69337. An equal opportunity employer.

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DL-1 exp w/design/user skills req for tech support & proj leadership response. Cent CT loc.

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Degree required. Environment is IBM 30XX, OS, IMS with financial apps exposure. The key to this position is REAL ESTATE apps experience. Visibility & growth potential unlimited and relocation pkg above average.

DOE \$30-36,000

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DOE \$24-35,000

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Degree required. 10+ yrs in DP with last 4+ yrs in tech support capacity. 43XX, OS, COBOL, CICS environment with interface from HP. MUST have 'on-hand' ability to sysgen, fine time, monitor, etc. System is coming from scratch - start up. Excellent benefit/growth potential.

\$MARKET

All positions above and many more are in Texas where "Long Necks," "Armadillos" and the "Cotton Eyed Joe" call home.

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In TX Dial (512) 736-2467

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Must have 1 yr exp on Tandem machine using COBOL. Exp w/IMS in mfg environment a plus.

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Must have in-depth knowledge of CICS & IMS. Technical consultant & project mgr positions available.

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Large division of Fortune 500 manufacturer seeks an experienced S/A familiar with both financial and manufacturing applications. Prior exposure to MACPAC or transportation systems would be a definite plus.

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Salary \$35,000

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#### Patricia Brown

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San Francisco, CA 94111  
(415) 434-1900

### NEW YORK

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Our client, a major retail holding company, has immediate need for their NYC staff. All candidates must have at least 2+ yrs systems & programming background (IBM/COBOL a plus). Travel 25% to southern NJ. Functions include data center review, program development and maintenance, and support of financial auditors. Tremendous oppy for the qualified systems professional to break into this fast-moving field. Fee Paid.

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#### SR P/A

#### SR S/A

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You'll find IOCS at the center of action in high technology, with Corporate Headquarters in Waltham (suburban Boston), directly off Route 128, America's Technology Highway. Our other centers of action are located at Atlantic City and Ft. Monmouth, NJ; Oklahoma City, OK; New London, CT; Portsmouth, NH; Newport, RI; and Washington, DC. But, if you keep up with new advances in software development and systems engineering/integration, chances are you already know where to find us.

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Although other openings are anticipated throughout the Company at our various sites, an immediate opening exists at our Waltham facility for a Program Manager having actual experience on a large software development project, whose responsibilities include technical direction, customer relations and the usual business management responsibilities. DoD experience essential as well as a background in the design and development of minicomputer-based systems.

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Requirements: BS, plus 5 years programming & analysis, one year as project leader; significant background in fund accounting, systems analysis & design; oral & written communications skills.

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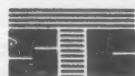
### MVS Specialist

You will provide technical support of MVS/SP. Requires MS/BSCS/EE (or equivalent), minimum 5 plus years experience on IBM or PC/M mainframes and a good understanding of MVS/SP internals. Recent experience on IBM 3081 a must. (Dept. 1573).

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Sysgen MVS/SP-JES2, install various program products, apply maintenance, prepare workload and diagnose problems. A BSCS/EE (or equivalent), 3 plus years experience on IBM or PC/M mainframes and a knowledge of ASSEMBLER, PL/1, COBOL, and FORTRAN required. Recent experience on IBM 3081 essential. (Dept. 1572).

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Will be responsible for the design specification of hardware and software for next generation controller/terminal systems. Your credentials should include: BS or MS in Electrical or Computer Engineering. At least 2-3 years in design of PCB's, microprocessor chips, communication networks (LAN). Experience with Motorola 68000 processors and peripherals, and knowledge of programming.

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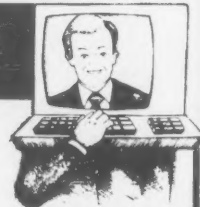
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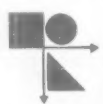
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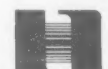
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Become part of the team on an exciting new TRW project. Develop software for the FAA Enroute Control Centers on state-of-the-art computer systems.

We are currently interviewing for the following positions which open in August.

### SYSTEM PROGRAMMER/SUPERVISOR

This position will be responsible for building and managing a staff of systems programmers and scientific applications programmers to develop software for the FAA enroute control systems.

Applicant must have 8 years experience in computer systems software with a broad exposure to IBM/AMDAHL operating systems. Experience in supervising personnel and developing software is required. Experience with VM and MVS and Assembly language is highly desirable.

### PROGRAMMER/ANALYST

This position will design, develop and rehost real-time application and executive software for the National Airspace System Host Modernization Project. Candidates must have experience with (IBM) Assembly language programming and (IBM) operating systems (MVS, CMS, MVT, PCP). Personnel selected will develop/rehost the software at the TRW Sunnyvale facility on state-of-the-art AMDAHL 580 computers. Opportunities will exist for a temporary assignment in Atlantic City, N.J., to integrate the final products at the FAA center.

### SYSTEM PROGRAMMERS

This position requires a minimum of 3 years experience with IBM 370/360 operating systems (MVT, MVS, VM), performing systems application of PTFs to the operating systems, design of interface software, and the tailoring of the system to satisfy the user community.

### SOFTWARE INTEGRATION/TEST ENGINEERS

These individuals will be responsible for planning and performing integration and test activities for in-plant and system-level testing. Applicant must have a minimum of 3 years in software testing and/or development. Knowledge of VM and MVS and experience with automated test tools. Familiarity with the FAA NAS software is desirable. Some of these positions will also support software integration at the FAA center in Atlantic City in the summer of 1984.

In addition to challenging projects, TRW offers a professional, highly technical environment, excellent advancement potential, a relaxed, friendly working atmosphere, and educational benefits. Our outstanding benefits plan includes a 4-day work week option, flex time, Christmas shutdown, vision care, and a stock plan.

For immediate consideration, send your resume in confidence to:

Eileen Eik  
TRW Software and Information  
Systems Division  
1145 Arques Ave.  
Sunnyvale, CA 94086

Equal Opportunity Employer  
U.S. Citizenship Required



### ADMINISTRATIVE APPLICATIONS COORDINATOR

Bowdoin College seeks an individual with an AB/BS with knowledge of business or college accounting practices, familiarity with on-line data base techniques, and the programming competence equivalent to 3 years of programming experience. Knowledge of FORTRAN will be desirable.

The Administrative Applications Coordinator will be responsible for the conversion, design, documentation and maintenance of programs for financial and other administrative records through an on-line, integrated file approach using a relational data base system as a fundamental tool. Additional responsibilities will include some training of administrative personnel in the use of relevant systems.

The Computing Center has a DEC System 1091 operating under TOPS-10 with 2.5 megabytes of memory and 900 megabytes of disk storage. The system serves administrative and academic users through 48 on-line terminals.

The college offers competitive salary and fringe benefits. Send letters of application and a resume before June 22, 1983 to:

Myron Curtiss, Director  
Computing Center  
Bowdoin College  
Brunswick, ME 04011  
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**TECHNICAL SPECIALISTS** -- applicants should have detailed experience in IBM BAL and ON-LINE REAL-TIME systems in a development environment. Exposure to IBM 3600/4700 banking terminals and FCL highly desirable.

**DATA BASE ADMINISTRATORS** -- applicants should have experience in physical and logical data base design in either an IMS or IDMS environment.

**ANALYSTS/PROGRAMMERS** -- applicants should have a minimum 3 years experience in IBM or NCR COBOL or BAL with some experience with 3600/4700 banking terminals, FCL, IMS, or IDMS.

Please respond with resume, or contact:

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The qualified candidate will have 6-10 years' professional programming experience with at least 2 years as a Systems Programmer in an IBM DOS/VSE environment. Assembler language skills required. Prefer experience in one or more of these areas: VM-CMS, S/370-4300 Hardware or CICS, COBOL, RPG II or T/P experience a plus.

Please forward your resume, in confidence, to: Employment Manager, OCLI, 2789 Northpoint Parkway, Santa Rosa, CA 95401-7397. Equal Opportunity Employer in our Pledge and Practice. U.S. citizenship required.

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## PROGRAMMER/ ANALYST OREGON

Challenging opportunity in the health care field for the management oriented professional. Will work closely with all hospital departments in developing expanding management information systems. Will assume responsibility for Information Systems Department in the absence of the director. The successful candidate will have RPG II experience in a system 34 interactive environment, top level analyst skills with hospital systems, and a plus, we are a 200 bed JCAH accredited acute care medical center located at the southern base of the Cascade mountain range with superb summer/winter recreational activities. Please forward resume and salary history to Mr. Don York, Director of Human Resources, Merle West Medical Center, 2300 Daggett, Klamath Falls, Oregon 97601 or you may call 802-843-2258.

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## PROGRAMMER/ANALYST POSITION

Person to assist in development of state-of-the-art MIS project and to instruct in data processing department. Must have bachelor's degree and 3 years experience in systems analysis, COBOL and BASIC programming, and DBMS and MIS software. Teaching experience a plus. Good salary and excellent fringes. Appointment begins August 1, 1983. Send resume, transcript, and 3 letters of reference by June 24, 1983, to:

Dr. Gary Parks, Information  
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East Central College, Box 529  
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Salary: Competitive in the field, plus excellent fringe benefits. Appropriate college degree with computer science course work. Knowledge of the Prime computer and COBOL language. Demonstrated ability and experience in programming, systems analysis, and design using medium to large computers, mini-, and micro-computers. Applicants with MIS background and experience in an integrated system, will be given added consideration. Apply to Personnel Office, Arizona Western College, P.O. Box 929, Yuma, AZ 85364, (602) 728-1000, Ext. 222. EOE

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To direct and manage a large data processing center servicing all county departments. Functions include systems, programming, operations and technical services utilizing IBM equipment and various mini-computers. Requires a college degree (experience may substitute for part of the educational requirement) and 5 years of administrative or staff experience which involves planning, organization, and implementation of management programs and projects. Excellent salary (to mid \$20's) plus management benefits package to include county car. Apply immediately!

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## Computer Professionals



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#### REAL-TIME OPERATING SYSTEMS

These senior level positions require a degree and at least 4 years experience in design, development and/or modification of real-time operating systems.

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NCR is the acknowledged leader in retail systems. It is the job of Systems Engineering-Retail in Dayton to maintain and extend this preeminence. It will be your job to engineer host system applications, and make our retail systems fully compatible with non-NCR systems.

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Establish a reputation as an expert at developing unified network systems, and your upward migration in NCR Systems Engineering can be swift. We have high priority openings for:

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Will design and develop strategic retail applications in "C" language for the SNA subsystem that will reside in a UNIX-based processor system. Must have minimum of 8 years programming experience with thorough knowledge of communications software development and network protocols, and in-depth knowledge of "C" as well as familiarity with VTAM, CICS and IMS.

#### Systems Analyst—UNIX Development

Will be responsible for designing and developing retail-oriented software for UNIX-based point-of-sale systems. Should have BSCS and 5-8 years of software development experience that includes in-depth knowledge of "C", and strong background in UNIX internals and UNIX-based development.

#### Programmer/Systems Analyst

Will be responsible for developing and maintaining applications software in an IBM host environment. You'll need a strong CICS and COBOL background as well as working knowledge of the IBM OS. Must have degree in Computer Science and a minimum of 3 years related experience. Familiarity with BAL language an asset.

For prompt, confidential consideration—and a briefing that will give you powerful inducements to join this highly strategic NCR operation—please send resume and salary history to: Mr. Stephen Green, Personnel Resources, Systems Engineering-Retail, NCR Corporation, Dept. H55, Software Development Center-4, Dayton, Ohio 45479.

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Computer Professionals

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This key growth-oriented management position calls for an individual with:

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To work in Fargo, N.Dak. manufacturing plant. This person will be the key individual in the department and will be responsible for the development and operation of an IBM-38 computer system for our manufacturing operation. Minimum of 1 year experience in an IBM environment with MAFICS or manufacturing software and a Computer Science Degree. For confidential consideration send resume to:

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HUMAN RESOURCES DIVISION

HERITAGE FEDERAL

Savings & Loan Association

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### PROGRAMMERS

PDP-8 Assembly  
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UNIX 'C'

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### DIRECTOR OF COMPUTER SERVICES

Central Wyoming College seeks applications for a position with responsibility for all input information to an administrative systems Microdata computer. Successful candidate will produce required reports, coordinate requests for modifications of existing programs with the Dean of Administration. Bachelor's Degree with a major or minor in Management Information Systems and/or accounting is required. Experience with Microdata systems preferred. Apply before June 17, 1983 to Patricia Sturdevant, Personnel Office, Central Wyoming College, Riverton, WY 82501. CWC is an Equal Opportunity Employer.

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Instructional responsibilities in office occupations for skills in typewriting, language arts, information management and word/information processing. Bachelor's degree required with a minimum of 9 semester hours in business data processing, including experience in use of computer assisted instructional techniques, and a minimum of 5 years teaching experience. Application deadline: June 15, 1983. Inquiries sent to Dean of Administration, Laramie County Community College, 1400 East College Drive, Cheyenne, WY 82007. An Equal Opportunity Employer.

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## Branch Management SOFTWARE DEVELOPMENT In Sarasota, Florida IBM 3600/4700 FCL

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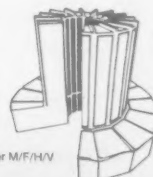
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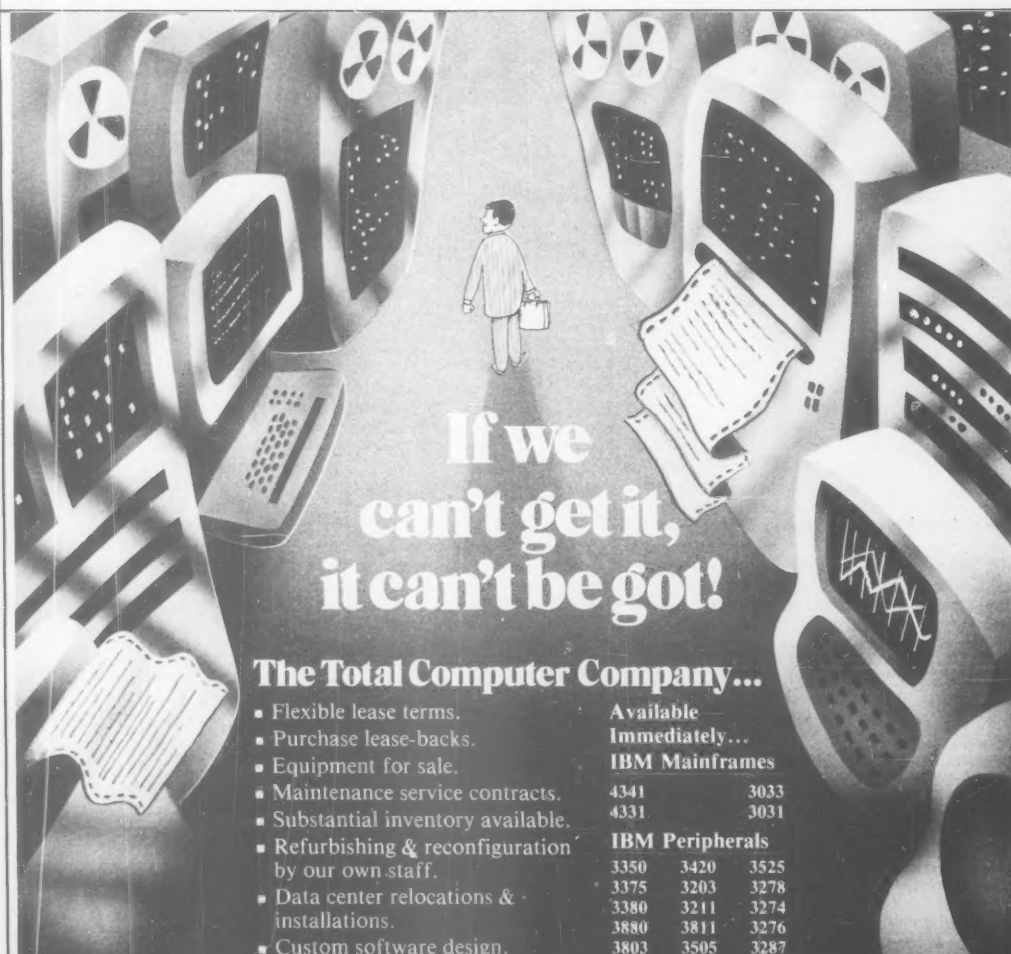
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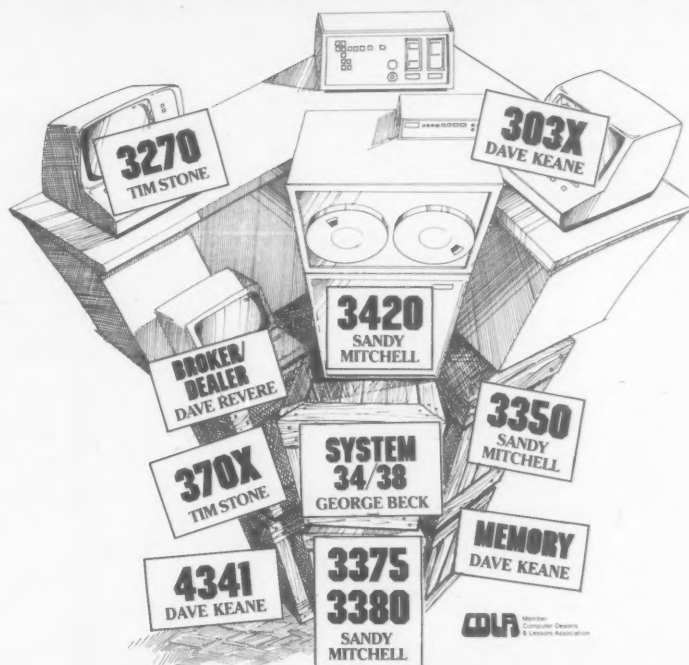
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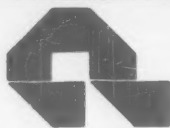
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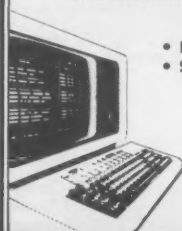
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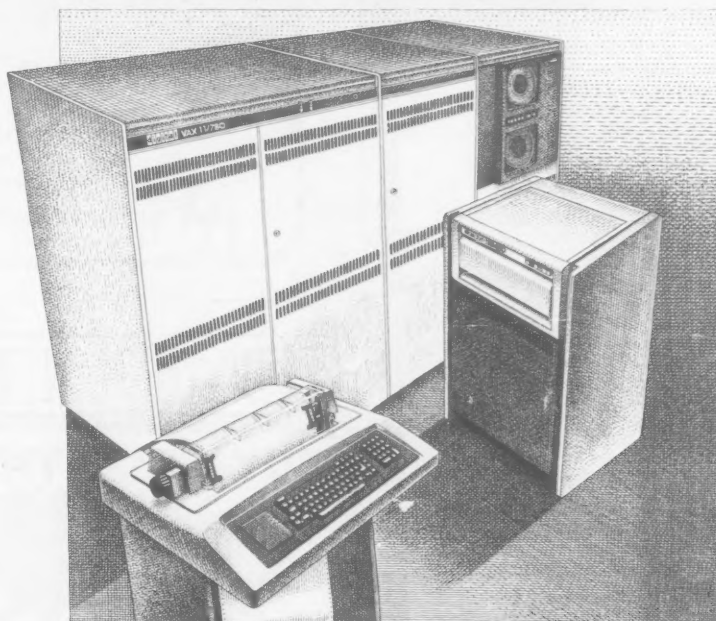
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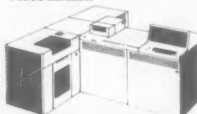
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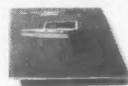
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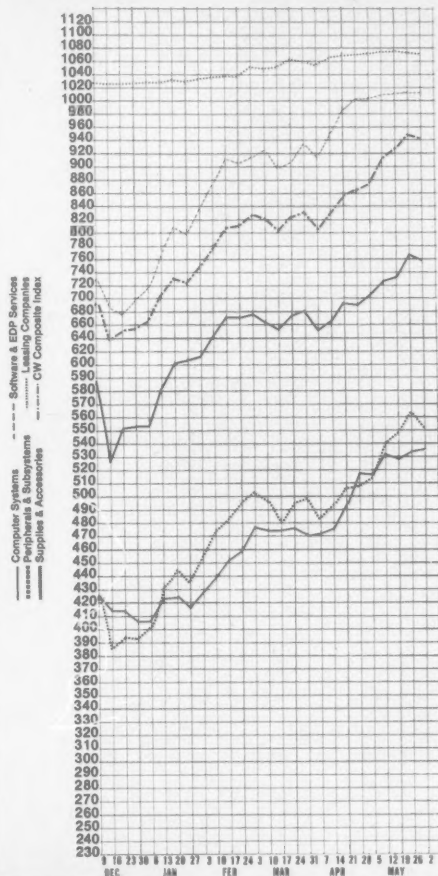
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CLOSING PRICES WEDNESDAY, JUNE 1, 1983

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C H	E	PRICE- CLOSING					C H	E	PRICE- CLOSING					C H	E	PRICE- CLOSING					C H	E	PRICE- CLOSING						
		1982-83 RANGE (1)	CLOSE JUNE 1 1983	WEEK CHNGE	WEEK PCT CHNGE				1982-83 RANGE (1)	CLOSE JUNE 1 1983	WEEK CHNGE	WEEK PCT CHNGE				1982-83 RANGE (1)	CLOSE JUNE 1 1983	WEEK CHNGE	WEEK PCT CHNGE				1982-83 RANGE (1)	CLOSE JUNE 1 1983	WEEK CHNGE	WEEK PCT CHNGE			
COMPUTER SYSTEMS										SOFTWARE & ERP SERVICES										COMPUTER DEVICES INC.									
A AMDAH CORP	17-55	34 1/4	+1 5/8	+6.0			O ADVANCED COMP TECH	1-7	5 1/2	0	0.0		O COMPUTER DEVICES INC	4-21	12	-1 1/4	-5.4			O INTEL CORP	21-60	56	-3 1/2	-5.8					
N BURROUGHS CORP	28-35	53 5/8	+3/8	+0.9			O ADVANCED SYSTEMS INC	9-28	27	0	0.0		N COMPUTERVISION CORP	19-30	46 3/8	-3 1/8	-6.3			N COMPAQ CORP	18-38	17 1/2	-1 1/2	-7.8					
N COMPUTER AUTOMATION	7-17	15 3/8	+1	+6.9			N AMACOM INC	2-23	17 1/4	5/8	+2.9		N COMBESS SYSTEMS	16-41	25 1/4	-1 1/4	-4.8			N DATA PRODUCTS CORP	16-41	25 1/4	-1 1/4	-4.8					
A COMPUTER CONSOLES	15-46	45 3/8	+3/8	+0.8			O ANALYSTS INTL CORP	5-14	13 1/4	0	0.0		O DATAMAN CORP	5-12	9 1/2	0	0.0			O DATUM INC	16-33	34 1/8	+7/8	+6.8					
N CONTROL DATA CORP	21-59	57	-2	-3.3			A APPLIED DATA RES.	8-38	33 3/8	-2 1/8	-5.9		O DAVID JARVIS CARLYL	5-12	9 1/2	0	0.0			O DELTA DATA SYSTEMS	1-4	3 1/4	-1/4	-7.1					
N CRAY RESEARCH INC	20-49	44 3/4	-3 1/4	-5.7			O ASR COMPUTER SYSTEMS	12-38	34	-2 1/2	-7.4		O ELECTRONIC M & M	5-11	10 1/2	+1/2	+5.0			O EVANS & SUTHERLAND	18-30	33 1/2	+3/4	+1.9					
N DATA GENERAL CORP	20-73	60 1/4	-7/8	-1.4			B ASTROGRAPH COMP IND	1-7	5 5/8	+1 1/8	+2.2		O GENERAL TERMINAL CP	1-2	2	0	0.0			O GREAT SOUTHWEST INC	2-6	6 3/4	+1/4	+6.3					
N DATAPOINT CORP	11-36	30 3/8	+1 7/8	+8.0			B AUTOMATIC DATA PRNT	1-7	5 5/8	+1 1/8	+2.2		O HUNTLEY CORP	7-27	27 1/4	+3/8	+2.8			O ICOT CORP	3-10	8	0	0.0					
N DIGITAL EQUIPMENT	62-132	114 1/2	+1 1/8	+0.8			O CBA COMPUTER ASSOC	5-15	14 1/2	-1/4	-1.6		O INFORMATION INTL INC	10-22	16 1/2	-3/4	-4.3			O INFO SYSTEMS INC	5-11	8 1/4	0	0.0					
A EEDC INC	6-15	14 3/8	+1/2	+3.6			D COMPUTER ASSOC INT'L	6-31	27 1/4	-2	-6.8		N INTEL CORP	21-60	56	-3 1/2	-5.8			N LUNDY ELECTRONICS	7-17	16 1/8	-3/8	-2.2					
N ELECTRONIC ASSOC.	5-12	1/4	0	0.0			D COMPUTER HORIZONS	2-12	2 1/2	+1/2	+5.0		N LUNDY ELECTRONICS	7-17	16 1/8	-3/8	-2.2			N M&I DATA CORP	4-24	14	-1/4	-1.4					
N FLOATING POINT SYST	18-38	36 1/4	7/8	+2.3			O COMPUTER NETWORK	4-10	9 1/8	-1/4	-2.6		O NETWORK SYSTEMS CORP	8-27	24 1/4	0	0.0			O OMEGA	3-6	5 1/2	-1/2	-3.0					
N FORBORG	22-44	43 3/4	+4 1/2	+11.4			N COMPUTER SCIENCES	11-23	17	-3/4	-4.2		O OMEGA	3-6	5 1/2	-1/2	-3.0			O PENNELL CORP	7-13	11 1/2	0	0.0					
N GENERAL COMPUTER	3-15	15 1/8	+1 7/8	+14.1			O COMPUTER TASH GROUP	8-23	17	-1/4	-1.4		O RANTER CORP	12-26	24	-1/4	-1.0			O REACTION EQUIP	6-27	11 3/4	-1/8	-0.7					
N HARRIS CORP	20-51	43 5/8	-7/8	-1.9			D COMPUTER USAGE	2-22	17 1/2	-1	-5.4		O SCIN DATA	1-3	1 1/8	0	0.0			O STORAGE TECHNOLOGY	18-33	21 1/4	-1 7/8	-8.1					
N HEWLETT-PACKARD CO	38-87	84	-2 3/8	-2.7			D COMPUTONE SYSTEMS	15-38	19 3/4	+1 1/2	+6.2		O SYNERG DATA SYSTEMS	6-27	11 3/4	-3/4	-2.7			O T&B INC	8-28	26 3/8	-7/8	-3.1					
N HONEYWELL INC	80-124	116 1/2	-5 3/8	-4.4			N CONSERV CORP	11-15	15 1/2	-2 1/2	-16.0		N T&B INC	8-28	26 3/8	-7/8	-3.1			N TEXTRONIX INC	34-76	73 1/2	-2 1/4	-2.6					
N IBER	57-118	111 7/8	-3 3/4	-3.2			O CONSHARE	8-13	12 5/8	+1 5/8	+14.7		N TEXTRONIX INC	34-76	73 1/2	-2 1/4	-2.6			N TELETYPE	5-27	20 3/4	-1 1/8	-5.9					
O IFS SYSTEMS INC	3-11	9 1/4	0	0.0								N TERNATA SYSTEMS CP	3-11	3 3/8	-3/8	-7.7			N TIFLEX INC	7-24	24	+1/4	+1.0						
O MAGNUM CORP SYSTS	2-5	3	0	0.0			N CULLINET SOFTWARE	12-46	46 1/4	+1 1/2	+3.3		O VISUAL TECHNOLOGY	9-25	24 3/4	+1/8	+0.5			O WILTEX INC	1-4	2 3/8	-3/8	-13.6					
O MANAGEMENT ASSIST	7-18	14 5/8	-3/8	-5.5			O CYCARE SYSTEMS INC	9-27	21 3/4	-4	-15.5																		
N MINI-COMPUTER SYST	1-2	1 7/8	0	0.0			O DATA DIMENSIONS INC	1-2	3/4	0	0.0																		
N MINIGRAM COMPUTER SYS	8-15	14 1/8	+1/8	+0.6			O DATACORP	2-4	3 3/8	+1/4	+6.0																		
N MINIGRAM DATA ACT	10-19	14 5/8	-3/8	-5.5			O DYATRON CORP	19-39	67 7/8	+1/8	+0.6																		
N NCR	39-123	117 3/8	-0 7/8	-0.5			N ELECTRONIC DATA SYS	19-39	67 7/8	+1/8	+0.6																		
N PERKIN-ELMER	17-33	23 1/4	-2 1/8	-6.9			N INFOMATICS INC	3-4	3 1/4	-2/4	-6.1																		
N PRIME COMPUTER INC	21-39	37 3/8	-1 1/2	-1.3			D INSITE CORP	1-3	1 7/8	+1/8	+7.1																		
N SPERRY CORP	17-39	37 3/8	-1 1/2	-1.3			N THE COMPUTER MARKET	1-2	2 1/8	0	0.0																		
O TANDER COMPUTERS INC	14-34	30 1/8	-1 5/8	-5.0			N KEANE ASSOCIATES	10-34	13 1/4	+1/4	+1.4																		
N TANDER INSTRUMENTS	1-16	16 3/4	-1 1/2	-8.3			A LORICON	12-42	41 1/2	+3/4	+11.7																		
A WAND LABS "B"	13-42	38 1/2	-0 1/2	-0.3			N LOGIC SCI AMER INC	12-36	31	+1 1/4	+4.2																		
A WAND LABS "C"	11-42	39 3/8	-2 7/8	-6.8			O MATHEMATICA INC	12-36	31	+1 1/4	+4.2																		
LEASING COMPANIES										MATHEMATICAL APP CORP										MATHEMATICAL APP CORP									
O BOOTHE FINANCIAL	22-45	42 1/2	-1	-2.2			N NATIONAL DATA INC	8-26	24 1/4	+1/8	+0.6																		
O COMBISOL INC	7-23	11 1/2	-1 3/8	-11.0			O PANOSPHIC APP	8-27	25 3/4	-1	-3.7																		
B COMMERCE GROUP CORP	1-3	1/4	0	0.0			N PLANNING RESEARCH	8-27	25 3/4	-1	-3.7																		
O COMPUTER INVESTORS GRP	1-3	1/4	0	0.0			O POLICY MGMT SYSTEMS	38-59	59	-1	-1.4																		
O CONFIDENTIAL INFO SYS	5-14	24 1/2	+1 1/2	+6.1			O PROGRAMMING & SYS	1-5	4 3/4	+1 1/8	+2.7																		
N DPF INC	9-14	12 3/8	-1/2	-3.7			O REYNOLDS & REYNOLD	17-46	41 3/4	-1/4	-0.5																		
O ITEL	1-3	3 1/8	0	0.0			O SEI CORP	11-34	30 1/2	-2 1/2	-7.5																		
O LEADCAP CORP	1-3	3 1/8	0	0.0			O SHARED MEDICAL SYST	13-37	36 1/8	+5/8	+1.7																		
N U.S. LEASING	18-47	43	-1 1/4	-2.8			O SCIENTIFIC COMPUTERS	8-13	12	-1	-8.0																		
										SOFTWARE APP										SUPPLIES & ACCESSORIES									
										N TSHRMAN INC										N AMERICAN BUS PRODS									
										A UHS CORP										O BALTIMORE BUS FORMS									
										N WVLV CORP										O BARRY HEIGHT									
																				O CYBERATICS INC									
																				A DUPLEX PRODUCTS INC									
																				O ENTER BUS FORMS									
																				N 3M COMPANY									
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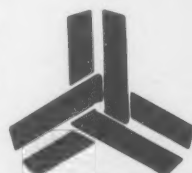
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